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ELEMENTS

OF

INTELLECTUAL PHILOSOPHY;

OR, AN

ANALYSIS

OF THE POWERS

OF THE

HUMAN UNDERSTANDING;

TENDING

TO ASCERTAIN THE PRINCIPLES OF A

RATIONAL LOGIC.

BY

R. E. SCOTT, A. M.

PROFESSOR OF MORAL PHILOSOPHY IN THE UNIVERSITY
AND KING'S COLLEGE OF ABERDEEN.

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TO

JAMES GREGORY, M. D.

PROFESSOR OF THE PRACTICE OF PHYSIC

IN THE

UNIVERSITY OF EDINBURGH,

&c. &c.

AS A TESTIMONY OF RESPECT FOR

WORTH AND TALENTS OF NO ORDINARY STANDARD,

THIS WORK

IS INSCRIBED,

BY HIS

MUCH OBLIGED FRIEND,

THE AUTHOR.

ADVERTISEMENT.

THE original intention of the following Sheets was merely to furniſh a Text Book for part of the Author's Academical Courſe. During the execution of this Plan, he found reaſon to believe that a ſhort Treatiſe, which ſhould contain an Analyſis of the Powers of the Human Underſtanding, tending to illuſtrate the Principles of ſound Reaſoning, and ſcientific Inveſtigation, might be a deſirable acquiſition to Students in general: becauſe the Elementary Syſtems of Logic which have yet appeared, are almoſt all founded upon the metaphyſical ſubtleties of the ſchoolmen; and have little reference to the preſent advanced ſtate of Intellectual Philoſophy. Actuated by theſe conſiderations, the Author preſumes to offer to the Public the following attempt to ſupply a deſideratum in Elementary Science; which may prove of ſome uſe to the Student, till an abler hand ſhall undertake the execution of the taſk.

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ELEMENTS

OF

INTELLECTUAL PHILOSOPHY.

INTRODUCTION.

THE moſt general diviſion of the objects of human knowledge, is into two claſſes, the material and intellectual; or the phenomena of body, and thoſe of mind. The diſtinguiſhing characteriſtics of matter or body are, extenſion, ſolidity, diviſibility, inertia, &c.: the diſtinguiſhing characteriſtics of mind are, to think, to remember, to will, &c.; properties which are of a very different nature from thoſe of body, or material ſubſtance. Hence the manifeſt propriety of dividing the objects of human ſpeculation into theſe two great claſſes.

The phenomena of the material world are made known to us, in the firſt inſtance, by our ſenſes and perceptive powers: the knowledge of mind, according to the above account of it, reſts more immediately upon the evidence of our own conſciouſneſs. We feel its operations within ourſelves; and, at the ſame time, we have ſufficient evidence that it exiſts in our fellow men, when we ſee the effects of ſimilar operations. The conduct of brute animals, too, proves that they have a thinking principle, though of a nature very inferior to that of man; inſomuch, that its principal qualities are included in thoſe of the human intellect. The proofs of intelligence and of ſuperintending providence, which a ſurvey of the works of nature amply furniſhes, lead to a firm belief in the exiſtence of a Supreme and

All-governing mind, of a nature infinitely ſuperior to that of the minds of brutes or of men.

Beſides the human mind, the minds of brutes, and the Supreme mind, it does not appear that our faculties are calculated to give us any certain knowledge concerning the great claſs of intellectual beings. Many ſpeculative men, both ancient and modern, have conjectured that there are, in the univerſe, various orders of intelligent beings, of different rank and dignity, to whoſe operation they aſſign thoſe natural phenomena which cannot eaſily be explained by mere matter and motion. Others have been inclined to explain theſe phenomena by the agency of beings that are active without intelligence, ſo as to perform their deſtined work without any knowledge or intention. But we may ſafely ſay, that, whatever may be the reſult of future inveſtigations, we have, as yet, no certain evidence with reſpect to theſe intermediate intellectual exiſtences.

The ſcience which inveſtigates the laws of the material world, is called Phyſics, or Natural Philoſophy; when we employ this term in its moſt extenſive ſignification. The ſcience of mind is denoted, perhaps, in its full extent, by the term Metaphyſics, or by that of Moral Philoſophy; although both are frequently employed in a more limited ſenſe. That particular branch of the ſcience of mind which treats of the Supreme Being, is termed Natural Theology, and does not come within the limits of our preſent inquiry. This is chiefly circumſcribed to an analyſis of the laws of human thought, or of that part of the human conſtitution, which is ſubſervient to ſpeculation and ſcientific inveſtigation, and which may, perhaps, with ſufficient propriety, be denominated Intellectual Philoſophy.

The utility of an analyſis of the powers of the human underſtanding, or of the ſcience of Intellectual Philoſophy, has been ſo ably illuſtrated by ſome late writers, particularly Dr Reid and Mr Stewart, that it is unneceſſary to waſte time in an endeavour to eſtabliſh it. This ſcience evidently furniſhes the proper baſis upon which all the others reſt; as the human faculties are the inſtruments by which alone invention in all the ſciences can be accompliſhed. The human mind, too, is the ſubject upon which all the ſciences, as well as the liberal arts, are intended to operate; ſo that an intimate acquaintance with its conſtitution ſeems to be eſſential, in order to ſecure ſucceſs in the cultivation of every branch of knowledge. Neither is it too much to ſay, that the buſineſs of education can never be properly conducted, without a due regard to the nature and gradual expanſion of the intellectual faculties; and that the moſt beneficial improvements may be expected in that important concern, when it ſhall become the object of the rational and enlightened inſtructor to unfold and bring to maturity the thinking and reaſoning powers; to check the irregular exerciſe of thoſe faculties which threaten to become too luxuriant; to prevent the influence of falſe and unnatural aſſociations; and to guide the affections and moral principle to thoſe objects with which they ought to be connected, by a rational regard to our preſent comfort, and to our future and eternal welfare.

The moſt obviouſly attainable of theſe advantages, by the due cultivation of intellectual ſcience, is the aſcertainment of the natural proceſs of ſcientific diſcovery, and the detection of thoſe ſources of error, and falſe reaſoning, which have generally pervaded the different branches of human knowledge. To accompliſh this, would be to form a ſyſtem of true and rational logic, of a far nobler nature than that diſputatious art which has hitherto borne the name. But it is by no means preſumed that the following attempt can effectually ſupply this great deſideratum in ſcience:

the utmoſt it pretends to accompliſh, is to deduce, from an analyſis of the powers of the human underſtanding, thoſe firſt principles of belief, which cannot be rejected without the moſt abſurd conſequences; which form the baſis of the various fabrics of ſcience that human ingenuity has built upon them; and which alone ſeem entitled to admiſſion on their own proper evidence; and conſequently form a teſt, or touchſtone, by which the various pretenſions to ſcientific improvement may be examined.

Such an inquiry, in addition to its uſefulneſs, has this further advantage, which indeed it poſſeſſes in common with all the other branches of the philoſophy of the human mind,—that it affords a ſubject of the moſt rational and liberal curioſity. For what can be more intereſting to man, than a diſplay of the ſtructure of the human mind? of that part of his nature by which alone he has been enabled to claim a ſuperiority over the numerous tribes of brutes; and to advance, by ſlow but certain ſteps, from the rudeneſs of the ſavage ſtate, to all the enjoyments of highly civilized life? If the anatomy of the human body be an intereſting object of ſtudy even to the man whoſe profeſſional views do not prompt him to ſuch inquiries; ſurely it is a much more intereſting ſtudy to analyze the human mind, whoſe nature and powers are ſo much more noble and wonderful than thoſe of the body.

It is generally acknowledged, that, notwithſtanding the utility and importance of intellectual ſcience, it has been, at leaſt till lately, but in a low and corrupted ſtate. The cauſes of this ſeem to have been firſt clearly pointed out by Dr Reid. The conjectural and hypothetical mode of reaſoning, which equally vitiated the phyſical and intellectual ſcience of the ancients, continued to pervade the metaphyſical diſquiſitions of the moderns, long after the genuine mode of philoſophizing in phyſics had been pointed out by Bacon, and ſucceſsfully exemplified by Newton. Another very copious ſource of error, in ſome meaſure peculiar to intellectual ſcience, is reaſoning by an aſſumed analogy. Our early notions are ſo much engroſſed and modified by material objects, that when we come, at a more advanced age, to ſpeculate concerning mind, our inveſtigations receive a certain colour and bias, from our previous knowledge of the properties of matter. Hence it is, that the very names of our intellectual faculties, and all the technical terms of intellectual ſcience, ſuch as *Underſtanding*, *Comprehending*, *Imagining*, &c. are borrowed from material objects. This gives riſe to an ambiguity in the language of intellectual ſcience peculiar to itſelf; and as, perhaps, no two ſpecies of beings are more eſſentially different than body and mind, reaſonings from a ſuppoſed analogy between their properties muſt evidently be a very copious ſource of error.

The firſt writer upon Intellectual Science, who has completely avoided both hypothetical and analogical reaſoning, is undoubtedly Dr Reid. The ſame excellent writer has alſo pointed out the true ſources from which the elements of our knowledge in this ſcience ought to be derived, viz. the exerciſe of Conſciouſneſs, by which the various operations of our own minds are made known to us; and a careful examination of the facts exhibited in the conduct of our fellow men, or recorded in the memorials of hiſtory, voyages, or the other ſpecies of literature. We are alſo indebted to Dr Reid for a preciſion of language, of which there was no previous example in metaphyſical writing, and which is doubtleſs of the greateſt importance in this and every other ſcience: For many of the conteſts which have been keenly agitated on various ſpeculative points, are found, upon examination, to reſolve themſelves into nothing more than a miſapprehenſion, or different application of terms.

The example which Dr Reid has ſet of previouſly explaining the meaning of every ſcientific term which is liable to any ambiguity, deſerves to be followed in all abſtruſe ſpeculations, and ſhall be adopted in this work whereever the caſe appears to demand it.

In conducting our analyſis of the intellectual powers, it is propoſed to adopt the following arrangement: 1*ſt*, To treat of Conſciouſneſs, or that faculty or mode of human thought, by which the various powers of our minds are made known to us.* 2*d*, Senſation, or the faculty by which we experience pleaſing or painful effects from various objects through the medium

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* The terms, *faculty*, *operation*, or *power*, *of the mind*, have long been employed to denote the various phenomena of human thought. It ought, however, carefully to be remembered, that, by the various *faculties* of the human mind, we do not mean any ſeparate and independent energies, which may be ſuppoſed to unite in forming the mind itſelf, but merely different modes of action of the ſame thinking principle. 'By the *mind* of a man,' ſays Dr

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Dr Reid, 'we underſtand that in him which thinks, re-'members, reaſons, wills. By the *operations* of the mind, 'we underſtand every mode of thinking of which we are 'conſcious. The *faculties* of the mind, and its *powers*, 'are often uſed as ſynonymous expreſſions. But as moſt 'ſynonymes have ſome minute diſtinction that deſerves 'notice, I apprehend that the word *faculty* is moſt pro-'perly applied to thoſe powers of the mind which are 'original and natural, and which make a part of the 'conſtitution of the mind.' (Eſſay I. on the Intellectual Powers, ch. 1.) It is in this ſenſe that I propoſe to uſe the word *faculty* in the following inveſtigations, as well as the word *power*, which may ſafely be conſidered, in moſt caſes, as ſynonymous with it.

The following paſſage, in the writings of Father Buffier, clearly ſtates the error that is ſometimes committed concerning the meaning of the word *faculty*: 'En effet, per-'ſonne ſe trompe-t-il à l'idée de ces facultés differentes? 'Ne ſait-on pas que c'eſt la même âme, qui produit di-'verſes operations? Selon que nous trouvons plus ou 'moins de difference dans ces operations, nous nous 'figurons dium of the ſenſes. 3*d*, Perception, the faculty by which we are informed of the properties of external objects, in conſequence of the impreſſions they make on the organs of ſenſe. 4*th*, Abſtraction, the faculty by which we analyze objects of Conſciouſneſs, Senſation, or Perception, &c. and contemplate their various properties apart from each other. 5*th*, Aſſociation, or Combination, the faculty by which we connect together theſe objects, according to various relations, eſſential or accidental, ſo that they are ſuggeſted to us, the one by the other. 6*th*, Conception, the faculty by which we repreſent to our minds the objects of any of our other faculties, variouſly modified. 7*th*, Memory, the faculty by which the mind has a knowledge of what it had formerly perceived, felt, or

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'figurons plus ou moins des facultés differentes d'où 'elles procedent; bien que ces facultés ne ſoient au 'fond, et réellement, qu'une ſeule et même ſubſtance, 'qui eſt l'âme.'

or thought; and, 8*th*, Reaſon, the faculty by which we are made acquainted with abſtract or neceſſary truth; and enabled to diſcover the eſſential relations of things.

CHAP-

CHAPTER FIRST.

Of Consciousness.

CONSCIOUSNESS, we have defined the faculty by which the various powers of our own minds are made known to us, and which, therefore, ſeems to demand the firſt place in an inveſtigation of the principles of human thought. The power of Conſciouſneſs appears to be altogether denied to the lower animals; nor does it ſhew itſelf in man till he is advanced towards maturity. The wants and purpoſes of life require that we ſhould form an intimate acquaintance with thoſe objects of nature with which we are externally connected, and which are the chief ſources of our pleaſures and pains. Hence, our ſenſes and perceptive powers come firſt of all to maturity; and thoſe which are purely intellectual, ſuch as Conſciouſneſs, are reſerved for the more contemplative period of life.

Conſciouſneſs, however, is a faculty which is exerciſed, not only by the philoſopher and man of contemplation, but alſo by the illiterate and buſtling part of mankind, though in different degrees. In the rudeſt languages there are words appropriated to expreſs various operations of the mind, ſuch as thinking, willing, perceiving, remembering, &c. which is a proof that ſuch things are attended to by all mankind, even the moſt uninſtructed, and ſpoken of as matters of knowledge and belief. In proportion as a people advance in cultivation, their language naturally becomes more copious in words of this deſcription; and as, in forming new terms, men are apt to borrow from thoſe already in uſe, by a metaphorical analogy, ſo it has happened, in this inſtance, that the names which denote the mental faculties have generally been derived from thoſe already appropriated to the phenomena of matter, according to ſome fancied analogy, which occaſions that peculiar ambiguity in the language of the ſcience of mind already mentioned.

It is worthy of remark on this ſubject, that, in our own language, as well as in moſt of the languages of Europe, almoſt all the terms applied to the mental faculties are of Latin origin, as, for example, *judgment*, *memory*, *conception*, *abſtraction*, *imagination*, &c. A very few only, ſuch as would neceſſarily occur in the language of a rude people, as for example, *thinking*, *willing*, *ſeeing*, *hearing*, &c. are of Saxon or Gothic original. This illuſtrates the natural progreſs of the human mind in what relates to Conſciouſneſs; and traces the origin of intellectual philoſophy, in the leſs civilized parts of Europe, to the firſt introduction of the Latin language.

Mr Locke denotes the faculty of which we are here treating, by the term *Reflection*, which he defines to be 'that power by which the 'mind turns its view inward, and obſerves its 'own actions and operations;' and all the notions which we form of an intellectual nature, ſuch as the notions of time, of number, of cauſe and effect, as well as our notions of thinking, remembering, willing, and the other laws of human thought, he calls 'ideas of reflection,' and repreſents them as derived ſolely from the operation of reflection or conſciouſneſs. The ambiguity of the term Reflection, has had a conſiderable ſhare in keeping out of view the inſufficiency of this doctrine; for this term is employed to denote, not only the power of contemplating our mental faculties, but likewiſe the ſpontaneous exerciſe of memory, or voluntary recollection, as well as the act of contemplation or cautious conſideration, and the more deliberate efforts of judgement. Hence, it is not wonderful that men ſhould be diſpoſed to acquieſce in the doctrine which comprehends all our intellectual notions under the claſs of ‘ ideas of reflection.’ But if, inſtead of reflection, we ſubſtitute the term Conſciouſneſs, limited as above, we ſhall find that many of our intellectual conceptions or notions cannot be aſſigned to it as their origin.

We might ruminate for ever upon our intellectual faculties, without acquiring ſuch a notion as that of time, for example, or of ſpace, or any of thoſe which are commonly called abſtract. The origin of ſuch notions will be a matter of future inquiry; and it will appear, that they are to be derived from the exerciſe, not of one, but of ſeveral of our intellectual faculties: at preſent, it is ſufficient to make this general obſervation upon the inſufficiency of that doctrine which derives all intellectual notions whatever from the exerciſe of reflection, or Conſciouſneſs.

Dr Reid ſeems to underſtand by the term

Reflection, the deliberate and ſedulous examination of the powers of our own minds; and in this ſenſe, thinks that it ought to be diſtinguiſhed from Conſciouſneſs. 'All men,' ſays he, (Eſſays on the Intellectual Powers, Eſſay I. ch. 5.) 'are conſcious of the operations of 'their own minds, at all times while they are 'awake; but there are few who reflect upon 'them, or make them objects of thought.' Again, ſays he, 'the difference between con'ſciouſneſs and reflection, is like to the diffe'rence between a ſuperficial view of an object 'which preſents itſelf to the eye while we are 'engaged about ſomething elſe, and that atten'tive examination which we give to an object 'when we are wholly employed in ſurveying 'it. Attention is a voluntary act; it requires 'an active exertion to begin and to continue 'it, and it may be continued as long as we 'will; but conſciouſneſs is involuntary, and 'of no continuance, changing with every 'thought.'

It would ſeem from this, and other expreſſions of the ſame author, that he conceived a greater difference to exiſt between conſciouſneſs and reflection, than a mere difference of degree. To me it appears, that reflection, taken in Dr Reid's ſenſe of it, is nothing more than the deliberate and mature exerciſe of conſciouſneſs; and the very illuſtration he employs to point out the difference, viz. that it is like that between a ſuperficial view, and an attentive examination of the ſame external object, ſerves to ſhew that the one is only a more deliberate and careful exerciſe of the other. Neither does it appear to be true, that we are 'at all times conſcious of the operations of our 'own minds while we are awake.' Conſciouſneſs, like memory, abſtraction, or any other mental faculty, may for a while lie dormant; or it may be exerciſed in a very ſlight degree; or it may engroſs for a time the whole of our attention: but it is ſurely the ſame faculty, whether it receives a ſlight or a ſedulous exerciſe.

To acquire a habit of reflection upon the powers of our own minds, or of the deliberate exerciſe of Conſciouſneſs, is, as Dr Reid obſerves, a work of time and labour, even to thoſe who begin it early, and whoſe natural talents are tolerably fitted for it. Of all the powers of the human mind, he obſerves, it ſeems to be the laſt that unfolds itſelf; and moſt men ſeem incapable of acquiring it in any conſiderable degree. Like all other powers, however, it is greatly improved by exerciſe; and it is by the proper employment of this power, that men become fitted to diſcover the laws by which their own thoughts are regulated, and to make advances in the ſcience of intellectual philoſophy.

As in the earlier period of life the faculty of Conſciouſneſs lies dormant, ſo there appear to be many intellectual proceſſes or trains of thought which paſs through the mind at that period, but of which, on account of the inactivity of Conſciouſneſs, no trace afterwards remains, ſo that we are ignorant, in ſo far as relates to ourſelves, of their having ever exiſted. It is upon this account that philoſophers have entered into ſo many keen diſputes concerning the origin of our ideas; ſome deriving them all from the ſenſes; ſome tracing a great part of them to reflection, as well as ſenſation; and ſome conſidering a certain claſs of them as innate, or coexiſtent with the mind itſelf. Did Conſciouſneſs exiſt in full power, at every period of life, ſuch diſputes could never have ariſen, and we ſhould then have been at no loſs to aſcertain at what moment we firſt formed a diſtinct conception or notion of *time*, for example; when we firſt clearly acquired the notion of *number*; and ſo forth. But, as we are at preſent conſtituted, it is a difficult problem in intellectual philoſophy to aſcertain theſe points.

Rude and uninſtructed men, being very

much in the ſituation of children, in as far as relates to the faculty of Conſciouſneſs, continue, in a great meaſure, ignorant of the trains of thought by which their conduct is regulated in many important particulars; and it forms no ſmall part of the buſineſs of the philoſopher, to aſcertain, by cautious inveſtigation, the intellectual proceſſes by which ſuch men have been guided, in a great degree, unknown to themſelves. Thoſe who have entered upon the ſcientific inveſtigations of grammar, of philoſophical criticiſm, of morals, or of politics, will ſee the full force of this obſervation. In forming a theory of morals, for inſtance, it has been found a matter of the greateſt difficulty to aſcertain the general principles by which men, more particularly in the uncivilized ſtate, are prompted to approve or diſapprove of certain actions, as virtuous or vicious; more eſpecially, as different tribes are found materially to diſagree in this particular. In like manner, it is the great difficulty of philoſophical grammar, to aſcertain thoſe trains of thinking which led men, in the earlier periods of ſociety, to expreſs their thoughts by thoſe particular claſſes of words which are found to exiſt in all languages; and it is the arduous object of philoſophical criticiſm to trace the ſecret cauſes of the mind's approbation or diſapprobation of certain productions of nature or of art, and to reduce theſe to a few general principles. In all theſe caſes, the buſineſs of the philoſopher is to detect thoſe mental proceſſes, which, from the uncultivated ſtate of the human faculties, had eluded the obſervation of Conſciouſneſs.*

Mr

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* 'Il ſemble,' ſays the acute D'Alembert, 'que tout 'ce qu'on apprend dans un bon livre de metaphyſique, 'ne ſoit qu'une eſpece de reminiſcence de ce que nôtre 'âme a dejà ſu; l'obſcurité, quand il y en a, vient toujours 'de la faute de l'auteur, parce que la ſcience qu'il ſe 'propoſe d'enſeigner, n'a point d'autre langue que la 'langue commune.'—'Les ſaines idées metaphyſiques

'ſont

Mr Stewart, in his Elements of the Philoſophy of the Human Mind, conſiders intellectual proceſſes of this nature as objects, not of *conſciouſneſs* but of *attention*; but to me there appears no neceſſity for calling in the aid of this new faculty. That ingenious philoſopher has given a variety of intereſting illuſtrations relative to trains of thought, which certainly are daily paſſing through our minds, but which are never recollected; becauſe, on account of their great rapidity, they are not objects of *attention*, or as I ſhould prefer to ſay, of *conſciouſneſs*. Such, for example, is that train of thought by which we are led to judge of the diſtances of viſible objects, and which includes in it a compariſon of various particulars, ſuch as the apparent magnitude of the

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'ſont des vérités communes, que chacun ſaiſit, mais que 'peu d'hommes ont le talent de developper; tant il eſt 'difficile, dans quelque ſujet qui ſe puiſſe être, de ſe 'rendre propre ce qui appartient à tout le monde.'— *Melanges, Vol. IV. Art.* 6.

the object, its diſtinctneſs or obſcurity, the brightneſs of its colours, the inclination of the axes of the eyes, and change of conformation of the eye itſelf. In this inſtance, and in ſome of the others mentioned by Mr Stewart, it may be remarked, that the inactivity of Conſciouſneſs is to be aſcribed, not only to the rapidity of the intellectual proceſs, but alſo to its having been familiarized to the mind in early life, before the faculty of Conſciouſneſs came into exerciſe. In other inſtances, particularly ſuch as are aſcribed to the mechanical agency of habit, as where a muſician comes, by long practice, to perform a piece of muſic with ſuch facility, as to be unconſcious of any voluntary effort, the inactivity of Conſciouſneſs ſeems wholly due to the rapidity of the mental exertions; and Mr Stewart appears to have been peculiarly ſucceſsful in illuſtrating the true nature of ſuch phenomena, which had been moſt unphiloſophically aſcribed to the influence of an undefined and miſunderſtood principle called Habit. But, for the ingenious remarks of this philoſopher, upon theſe intereſting topics, we refer to his own work, chapter ſecond.

To the exerciſe of Conſciouſneſs we are chiefly indebted for the conviction or notion of perſonal identity. Every man holds himſelf to be abſolutely certain, that whatever changes his body may undergo in this life, his ſoul or mind always continues one and the ſame; not liable to that alteration and diſunion of parts to which all corporeal beings appear to be ſubject. Along with Conſciouſneſs, however, we muſt conjoin memory, in order to give a rational explanation of the origin of this conviction. For Conſciouſneſs reaches only to the preſent, while memory alone gives a knowledge of paſt thoughts; and it is by comparing our paſt and preſent mental operations together, that we form the conviction of our perſonal, or rather intellectual identity. Hence, in this inſtance, as in various others, the ſyſtem of Mr Locke, which derives all our intellectual notions from the exerciſe of conſciouſneſs, or reflection alone, is inapplicable. (See Reid's Eſſays on the Intellectual Powers, Eſſay III. ch. 4.)

The operation of Conſciouſneſs is accompanied with an irreſiſtible belief of the real exiſtence of thoſe objects of which it gives us information. It is upon this evidence alone, that the belief in the exiſtence of our own minds, and of their various faculties, reſts; and it is by means of it that we acquire our moſt accurate knowledge of the laws by which theſe faculties are regulated. Nor can the belief accompanying Conſciouſneſs be reſolved into any proceſs of reaſoning, or any other intellectual operation: for, if we are aſked why we believe that we have a ſoul, and that that ſoul has ſuch faculties as memory, conception, or the like, we ſhall be unable to give any better reaſon, than that we *feel* ſuch to be the caſe;

that is, in more accurate language, that we are *conſcious* of it. The fact already mentioned, that in all languages there are found words intended to denote the various intellectual proceſſes, is a ſufficient proof that the evidence of Conſciouſneſs is felt and admitted by all men, even the moſt unenlightened.

When Deſcartes was ſolicitous to form a new ſyſtem of philoſophy, free from the abſurdities and falſe aſſumptions of the ſchoolmen, the principle which ſtruck him, as the moſt clearly evident of any, and which he ſeems to have thought alone worthy of being admitted without a proof, was the evidence of Conſciouſneſs. '*Cogito, ergo sum.*' 'I think,' ſaid he; 'therefore I exiſt.' This celebrated fundamental propoſition has been conſidered by Dr Reid as, after all, nothing but a *petitio principii*; inſomuch, that before we allow that we *think*, we muſt take it for granted that we *exist*. If, however, we underſtand the propoſition as merely inferring exiſtence from the evidence of Conſciouſneſs, it does not appear liable to this objection. Even Mr Hume, the moſt ſceptical of all modern philoſophers, appears implicitly to admit the evidence of Conſciouſneſs, in ſo far, at leaſt, as regards the reality of his *impreſsions* and *ideas*, whoſe exiſtence he ſeems entirely to reſt upon the ſuppoſed fact of our being conſcious of them. Thus, we may conſider the evidence of Conſciouſneſs as one of the moſt univerſally admitted intuitive truths. But that this is the only truth which is to be admitted intuitively, or on its own proper authority, according to the Carteſian and Sceptic ſyſtems, is what we are by no means inclined to allow, as will ſufficiently appear from the following inveſtigations.

CHAPTER SECOND.

Of Senſation.

SECTION I.

General Remarks upon Senſation.

We have defined Senſation to be, the faculty by which we experience pleaſing or painful effects from various objects through the medium of the ſenſes. This, therefore, is that part of our intellectual conſtitution which is moſt intimately affected by corporeal beings; and forms the principal link in that myſterious union which ſubſiſts betwixt body and mind. The ſenſes, too, which are the media of ſenſation, come to maturity even in infancy; ſo that this faculty, on account of its familiarity, naturally demands to be firſt conſidered among the objects of our Conſciouſneſs.

Till the writings of Dr Reid, Senſation and Perception ſeem to have been conſidered by philoſophers as ſynonymous terms, and uſed indiſcriminately as ſuch; from which no ſmall confuſion has ariſen in their ſyſtems. To Dr Reid we owe the clear aſcertainment of the diſtinction between theſe terms, which, in fact, appear to denote different faculties of the mind, which, though generally, are not conſtantly conjoined. Perception, as limited by Dr Reid, denotes that faculty of the mind, by which we learn the properties of external objects through the medium of the ſenſes; and he thus draws the diſtinction betwixt it and Senſation. 'Senſation,' ſays he, 'taken by itſelf, implies 'neither the conception, nor belief of any 'external object. It ſuppoſes a ſentient being, 'and a certain manner in which that being is 'affected; but it ſuppoſes no more. Percep-

‘ tion implies an immediate conviction and be‘ lief of ſomething external; ſomething different ‘ both from the mind that perceives, and from ‘ the act of perception.’ (Eſſay II. Ch. 16.) According to this diſtinction, the very eſſence of a ſenſation conſiſts in its being felt; and, when it is not felt, it ceaſes to exiſt, and has no longer any object; while the objects of perception have a permanent exiſtence without us, whether they are perceived or not.

That Senſation and Perception are different faculties, may be inferred from this circumſtance in particular, that though generally, they are not conſtantly conjoined; ſo that there may be ſenſation without perception, and perception without ſenſation. Thus, in many of thoſe ſenſations, the cauſe of which exiſts within our own bodily frames, as in the thrilling ſenſation which accompanies certain affections of the mind, the painful ſenſation of hunger and the like, it cannot be ſaid that we have any perception,

ception, or mental notion of the nature of the particular cauſe of theſe ſenſations. And again, in the caſe of many of the perceptions of ſight, as of extenſion, figure, magnitude, &c. as viewed by the eye, it can ſcarcely be ſaid that there is any accompanying ſenſation even of the moſt indifferent kind. Hence, Senſation and Perception ought to be ſeparately treated of, in an enumeration of the faculties of the human mind.

We may conſider the five ſenſes as the media by which all ſenſation is communicated to the mind, taking the ſenſe of Touch in its moſt extenſive application, as diffuſed over our whole corporeal frame. But in what manner theſe organs contribute to excite the various ſenſations which we are capable of experiencing, or how the communication between material objects and our immaterial thinking principle, is carried on, are queſtions which, however much they may have excited the curioſity, have hitherto entirely eluded the ingenuity of inquiſitive men. Anatomiſts have carefully analyzed the various organs of ſenſe, as well as the ſtructure of the nerves and brain; and are able to ſhew us that, in all the ſenſes, the peculiar impreſſions ſeem to be communicated to the nerves; and as all the nerves terminate in the brain, the impreſſions are probably finally conveyed thither. This is all the real inſight they have given us into the matter. But philoſophers are by no means ſatisfied with this; and have endeavoured to inform us of the peculiar manner in which theſe impreſſions are conveyed by the nerves to the brain. According to ſome, this is by means of a fine animal ſpirit with which the nerves are filled; and this is the moſt ancient opinion upon the ſubject. According to others, the nerves are ſolid filaments, which, by means of various vibrations, dependent upon their length and tenſion, communicate their impreſſions to the brain. This laſt hypotheſis ſeems to have originated with

Dr Briggs; and it was eſpouſed by Sir Iſaac Newton, under the modification, that the impreſſions on the ſolid filaments of the nerves were propagated by the undulations of an elaſtic fluid or æther, which was ſuppoſed to pervade all ſpace. (See 23d Query ſubjoined to his Optics.)

It muſt be remembered, that ſuch ſpeculations are merely hypothetical; as no anatomiſt has yet been able to eſtabliſh, whether the conſtituent filaments of the nerves are of a tubular, or ſolid ſtructure. Sir Iſaac Newton, indeed, is careful to ſtate the matter merely as a conjecture, or hypothetical query. But Dr Hartley purſued a very different courſe; and, in his 'Obſervations on Man,' founds the whole of his ſyſtem upon the doctrine of theſe ſuppoſed vibrations of the brain and nerves, joined with that of aſſociation. Of ſuch a ſyſtem it may be obſerved, that not only it is a mere hypotheſis, and therefore of no real value as a work of ſcience; but that it is likewiſe an anatomical, and not an intellectual ſyſtem; for its object is to trace, a few ſteps further, thoſe changes which take place in our bodily ſtructure, in conſequence of impreſſions made upon the organs of ſenſe; and, granting that the real exiſtence of vibrations, and vibratiuncles, could be eſtabliſhed, we ſhould be as far as ever from comprehending the nature of the action of body upon mind, or of mind upon body. The ſame remark may be made upon the various hypotheſes which have been offered concerning the immediate ſeat of the intellectual principle, or ſoul; which ſome have placed in a particular portion of the brain; ſome in the heart or præcordia; ſome have conſidered as diffuſed over the whole ſyſtem; and which, it is well known, Deſcartes conſidered as ſituated in the *pineal gland;* finding that to be the only part of the brain which was not double, or belonging to both lobes. Such hypotheſes are, in fact, mere anatomical fancies, and, even if eſtabliſhed, could throw little light upon the conſtitution of our intellectual principle.

When ſenſation is excited in the mind, it is generally in conſequence of ſome impreſſion firſt made upon the corporeal ſenſes. But, in ſome inſtances, the cauſe originates in the mind, and is thence communicated to the bodily organs, while apparently an effect is produced preciſely ſimilar to that of the more uſual kind of ſenſation. It is well known, that the mere thought of pain in any particular part of the body, is ſufficient to excite the correſponding ſenſation to a certain degree: Thus, the idea of ſore eyes produces a certain degree of pain in thoſe organs; and the ſtrong imagination of any particular taſte or flavour, is accompanied with a ſlight ſenſation of that taſte or flavour.

Again, many affections of the mind are accompanied with ſtrong ſenſations, either pleaſant or painful. Anger, terror, envy, revenge, and all the train of malevolent paſſions, have a very powerful effect upon the bodily frame, and excite ſenſations which are of a very diſagreeable kind. Upon the other hand, joy, admiration, love, and all the amiable emotions, produce ſenſations, which are decidedly pleaſurable. Such ſenſations are, not unuſually, in common language, called feelings; a name, however, which more properly belongs to the pleaſurable effect of our benevolent affections and moral judgments, as well as to the pleaſure accompanying our approbation in matters of taſte, as remarked by Dr Reid. Theſe feelings appear to be almoſt purely of an intellectual nature; while the term Senſation, as we wiſh to limit it, includes a diſtinct affection of the body as well as the mind.

According to this view, our ſenſations may be divided into thoſe which ariſe from the operation of material objects upon the five ſenſes;

thoſe which accompany our appetites, as hunger, thirſt, and the like; and thoſe which ariſe from the action of the paſſions and ſtronger emotions. Some of the ſenſations ariſing from theſe ſources are decidedly pleaſant; others are painful; and others indifferent. Theſe laſt, in the opinion of Dr Reid, are by far the moſt numerous of the three kinds; but ſo little attention is paid to them, that they have no names, and are immediately forgot, as if they had never been; ſo that it requires a conſiderable degree of attention to the operations of our minds, to be convinced of their exiſtence. Inſtead of indifferent, it would perhaps be more ſtrictly proper to call them ſlightly pleaſant, or ſlightly painful; as ſome degree of pleaſure or pain, however ſmall, ſeems eſſentially neceſſary to the very exiſtence of ſenſation.

SECTION II.

Of the Primary and Secondary Qualities of Body.

SENSATION, as we have obſerved in the preceding ſection, is generally conjoined with perception, or that mental faculty by which we form a notion of the properties of external objects, inſomuch, that the two acts of the mind have been confounded together, not only by the vulgar, but by philoſophers themſelves. In ſcarcely any inſtance does language afford an appropriate name both for the Senſation and Perception which are ſo conjoined; both are generally confounded together under one term, which comes to be more ſtrictly appropriated, either to the ſenſation or the perception, according as the one or the other more ſtrongly occupies the attention of the mind.

If it be aſked, what I mean by the '*ſmell* 'of a roſe,' it is evident that, in the general acceptation of the phraſe, this denotes a ſenſation of the mind; as appears from the epithets 'fragrant, agreeable,' &c. which are applicable to it, and which alone have meaning when referred to a ſentient being. Along, however, with this ſenſation of an agreeable odour, there is conjoined a perception, by which we form a certain notion of that quality in the roſe which is the cauſe of its odour; which perception is totally diſtinct from the ſenſation; for it cannot be ſaid to be agreeable or otherwiſe, and it has an external object, whoſe exiſtence does not depend upon the act of the mind as the ſenſation does. Yet we have no name whereby to diſtinguiſh the object of this perception, unleſs that which more properly belongs to the accompanying ſenſation, viz. 'the *ſmell* of the roſe;' a defect of language, which is no doubt the ſource of much ambiguity.

Again, if it be aſked, what is the effect produced by applying the hand upon any ſolid and compact ſubſtance, it will be anſwered, that 'we feel the body to be hard.' The term *hardneſs*, in its common acceptation, denotes a well known quality of external objects, that is, a mere object of perception; but, if we attend for a moment to what paſſes in the mind upon the preſent occaſion, we ſhall be conſcious of a very diſtinct ſenſation, which is likewiſe the effect of the application of the hand to the ſolid body, and for which we have no other name than the ſame term *hardneſs*. This ſenſation may be increaſed in ſtrength at pleaſure, merely by increaſing the preſſure of the hand; and it may be increaſed to ſuch a degree as to be very diſagreeable. It then arreſts the attention forcibly enough, and we give it the name of *Pain*, which is, however, no appropriate term, but the common appellation of all ſenſations that are diſagreeable; and it ought to be remarked, that the ſenſation excited by hardneſs, continues to be perfectly the ſame in kind, though different in degree, although, when ſlightly excited, it almoſt entirely eludes our attention.

Thus it appears, that language affords, in general, but a ſingle term whereby to diſtinguiſh both the ſenſation and its accompanying perception; and that this term is chiefly appropriated either to the ſenſation or perception, according as the attention is moſt engroſſed by the one or the other. Upon this circumſtance appears to be founded a diſtinction of the qualities of body into two kinds, called by Mr Locke, *primary* and *ſecondary*. The reality of the diſtinction I would place in this, that the primary qualities are thoſe of which we have a diſtinct perception, and but a ſlight ſenſation; while, of the ſecondary, our perception is but obſcure, and we have a ſtrong ſenſation, which chiefly arreſts our attention. Hence, the names of the primary qualities of body more uſually refer to the perception by which they are made known to us; while thoſe of the ſecondary qualities have more properly a reference to the accompanying ſenſation.

This account of the matter nearly correſponds with Dr Reid's explanation of the diſtinction between the primary and ſecondary qualities of body. According to that philoſopher, 'they are diſtinguiſhed by this, that of 'the primary we have, by our ſenſes, a direct 'and diſtinct notion; but of the ſecondary, 'only a relative notion, which muſt, becauſe 'it is only relative, be obſcure: they are con'ceived only as the unknown cauſes or occa'ſions of certain ſenſations with which we are 'well acquainted.' (Eſſay 2. ch. 16.) Hence, as is afterwards obſerved by the ſame writer, 'The diſtinctneſs of our notions of primary 'qualities prevents all queſtions and diſputes 'about their nature. They are the object of 'the mathematical ſciences; and the diſtinct-

'neſs of our notions of them, enables us to 'reaſon demonſtratively about them to a great 'extent. It is not ſo with ſecondary qualities. 'Their nature, not being manifeſt to the ſenſe, 'may be a ſubject of diſpute. It is a proper 'ſubject of philoſophical diſquiſition; and, in 'this, philoſophy has made ſome progreſs. It 'has been diſcovered, that the ſenſation of ſmell 'is occaſioned by the effluvia of bodies; that of 'ſound by their vibration. The diſpoſition of 'bodies to reflect a particular kind of light, 'occaſions the ſenſation of colour. Very cu'rious diſcoveries have been made of the na'ture of heat; and an ample field of diſcovery 'in thoſe ſubjects remains.' (Ib.)

The diſtinction which I have been endeavouring to illuſtrate, has undergone various modifications in the ſyſtems of philoſophers; and has, at ſome periods of its hiſtory, given riſe to various ſingular doctrines, and erroneous inferences. The diſtinction is pretty plainly laid down, ſo long ago as in the original Atomical philoſophy, as taught by Leucippus, Democritus, Epicurus, &c. According to that philoſophy, extenſion, figure, motion, &c. which we now call primary qualities, were inherent in the atoms, or firſt principles of things; but ſmell, taſte, colour, &c. or the ſecondary qualities, to which alone the atomiſts gave the name of *quality*, were not inherent in bodies, but were ſomething reſulting from the operation of bodies upon our ſenſes. As fire, ſaid they, which is neither in the flint nor in the ſteel, is produced by their colliſion; ſo thoſe qualities, though not in bodies, are produced by their impulſe upon our ſenſes.

The diſtinction between primary and ſecondary qualities was diſcarded in the Peripatetic philoſophy, but it was revived by Deſcartes, who reduced the claſs of primary qualities to three only, extenſion, figure, and motion. Mr Locke, however, enlarged this claſs, ſo as to comprehend, in addition, ſuch qualities as diviſibility, ſolidity, hardneſs, ſoftneſs, fluidity, and the like; and was at great pains to illuſtrate the diſtinction between the two kinds of qualities to which he firſt applied the terms primary and ſecondary. Subſequent philoſophers have either admitted or rejected this diſtinction, according as it ſuited the particular views of their ſyſtems.

The doctrine concerning the ſecondary qualities, taught by the Atomiſts, that they were not inherent in bodies, but reſulted from the operation of bodies upon our ſenſes, was more fully illuſtrated by Deſcartes: Sound and colour, taſte and ſmell, heat and cold, were, according to that philoſopher, ſenſations in the mind, and could not be modifications of mere extenſion, figure, and motion. Mr Locke pointed out this diſtinction betwixt Senſation and the external qualities of body, yet more clearly; but the concluſions to which theſe philoſophers were led, were ſuch as a complete view of the ſubject would by no means have warranted. Attending ſolely to the ſenſation, in the caſe of the ſecondary qualities, and not to the accompanying perception, they were led to aſſert, that the ſecondary qualities of body have no exiſtence whatever but in the mind, which perceives, or rather feels them. Heat and cold, ſmells and taſtes, ſay they, are things which cannot exiſt in inanimate, unfeeling matter, and are attributes of a ſentient being only. So that, according to this doctrine, it is a vulgar error to ſay, that heat is in the fire, or fragrance in the roſe; ſince heat and fragrance are ſenſations that can exiſt only when felt by the mind.

The foundation of this doctrine, which was conſidered as a brilliant diſcovery in its day, appears to be nothing more than an ambiguity of language, whereby, as already obſerved, the ſame name is generally applied, both to a ſenſation in the mind, and to the cauſe of that ſenſation as it exiſts in ſome external object. Thus, the term *heat* denotes the peculiar ſenſation which fire excites in a ſentient being, and alſo that quality in the fire which is the cauſe of it. This ambiguity was felt to be ſo inconvenient in ſcientific language, as to induce modern chemiſts to invent a new term, viz. *caloric*, by which they denote the external quality, or cauſe, of the ſenſation of heat; ſo that, in this inſtance, the ambiguity no longer exiſts. It was, however, merely in conſequence of this ambiguity, that philoſophers convinced themſelves that there was no heat in the fire, employing the term, *heat*, as denoting a ſenſation only; and the ſtrength of their reaſoning totally diſappears, when it is conſidered, that *heat* is the only term by which the vulgar, at leaſt, denote the external cauſe of the ſenſation, as well as the ſenſation itſelf. The ſame reaſoning is eaſily applicable to all the other ſecondary qualities, as ſounds, taſtes, ſmells, &c. In this inſtance, therefore, the vulgar were better reaſoners than the philoſophers; for the vulgar by no means confound together the ſenſation and perception which are excited by external objects, although they have not an appropriate name for each. But the philoſophers, in the caſe of the ſecondary qualities, entirely overlooked the perception; as, in the caſe of the primary, they ſeem to have paſſed by the ſenſation: and hence the origin of their ſcepticiſm with regard to the permanent exiſtence of the ſecondary qualities; a ſcepticiſm which we ſhall immediately ſee was extended by ſubſequent philoſophers to the exiſtence of the primary qualities themſelves. *

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* It ought, however, to be ſtated, in juſtice to the ſagacity of Mr Locke, that after fully illuſtrating the difference between the primary and ſecondary qualities, according to which, the laſt are ſtated to have nothing reſembling

The three ſenſes of taſte, ſmell, and hearing, appear to give us information of the ſecondary

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reſembling them in the actual texture of material ſubſtances, that ingenious philoſopher preciſely admits, that there is ſtill *ſomething* in body, which is the cauſe of theſe ſecondary qualities.

‘ The qualities,’ ſays he, (B. II. c. 8. § 23.) ‘ that are in bodies, rightly conſidered, are of three ſorts. *1ſt*, The bulk, figure, number, ſituation, and motion, or reſt, of their ſolid parts; theſe are in them, whether we perceive them or no; and when they are of that ſize that we can diſcover them, we have, by theſe, an idea of the thing as it is in itſelf, as is plain in artificial things. Theſe I call primary qualities. *2dly*, The *power* that is in any body, by reaſon of its *inſenſible primary qualities*, to operate after a peculiar manner on any of our ſenſes, and thereby produce in us the different ideas of ſeveral colours, ſounds, ſmells, taſtes, &c. Theſe are uſually called ſenſible qualities. *3dly*, The power that is in any body, by reaſon of the particular conſtitution of its primary qualities, to make ſuch a change in the bulk, figure, texture, and motion of ſecondary qualities of body alone; the other two ſenſes, of ſight and touch, inform us both of

This ſtatement appears to be almoſt entirely conformable to the common notion, and to the doctrine which we have been deſirous of eſtabliſhing; yet, in a few ſentences afterwards, Mr Locke recurs to the philoſophical diſtinction, by which the exiſtence of ſecondary qualities is entirely overthrown. 'But,' ſays he, 'though 'theſe two latter ſorts of qualities are powers barely, 'and nothing but powers, relating to ſeveral other bodies, 'and reſulting from the different modifications of the 'original qualities, yet they are generally otherwiſe 'thought of. For the ſecond ſort, viz. the powers to 'produce ſeveral ideas in us by our ſenſes, are looked 'upon as *real qualities* in the things thus affecting us:— '*e. g.* the idea of heat or light, which we receive by our 'eyes or touch, from the ſun, are commonly thought 'real qualities exiſting in the ſun, and ſomething more 'than mere powers in it.'

'another body, as to make it operate on our ſenſes 'differently from what it did before. Thus, the ſun has 'a power to make wax white, and fire to make lead 'fluid. Theſe are uſually called powers.'

of primary and ſecondary qualities. Heat and cold are ſecondary qualities diſcernible by touch; and colour is a ſecondary quality diſcernible by ſight. For colour is a ſenſation occaſioned by the fitneſs of certain particles of external bodies to reflect ſome only of the rays of light; and, in this acceptation, it really exiſts in the ſentient being, although early prejudice induces us to refer it to the external body alone; and the term is uſually applied only to the external cauſe of the ſenſation, and not to the ſenſation itſelf, which is not the caſe with the other ſecondary qualities. All the primary qualities of body may be diſcovered by the ſenſe of touch alone; and it is this ſenſe which imparts the moſt accurate notions concerning them. For the notions of extenſion and figure, as conveyed by the eye, require the correction of the touch; and even motion, which might be ſuppoſed to be the peculiar province of ſight, can only certainly be aſcertained by the touch, becauſe the eye often judges motion to be real, when it is but apparent.

In the opinion of Dr Reid, colour is the only perception received by the eye, which is accompanied with a ſenſation. But this perception and ſenſation is conjoined with almoſt every act of the ſenſe of ſight, and may, in certain ſtates of the eye, be experienced without the notion of extenſion or figure. Thus, as we are at preſent conſtituted, almoſt all our perceptions are accompanied by certain ſenſations, ſtrong or weak, which nature ſeems to have intended, not only as ſources of gratification to the individual, but as impreſſive ſigns, whereby the attention or energy of the mind ſhould be properly rouſed to acquire a knowledge of the properties of external matter.

CHAPTER THIRD.

Of Perception.

SECTION I.

Theories concerning Perception.

We have already had occaſion, ſufficiently to explain the ſenſe in which we employ the term Perception, and the diſtinction betwixt it and Senſation, in treating of this laſt faculty. According to the common arrangement, Perception ſhould have been firſt treated of; but I have preferred commencing with Senſation, as being the moſt corporeal (if I may ſo expreſs it) of all the intellectual faculties, and as being leſs incumbered with the fanciful hypotheſes of philoſophers than the faculty, of which I am now to ſpeak. The corporeal organs of ſenſe are ſubſervient to the operation of the faculty of Perception, as well as of Senſation, which generally accompanies it. Yet it is not unreaſonable to ſuppoſe, that theſe organs rather limit and circumſcribe this intellectual faculty, than that they are eſſential to its operation; and that beings of a ſuperior order may enjoy perception in a much more perfect degree than we do, uncircumſcribed by bodily organs like ours. A perſon who had been all his life ſhut up in a chamber with a ſingle window, would naturally conceive that window to be eſſential to his ſight, inſtead of being the cauſe of his very limited view.

We have ſeen with how little ſucceſs philoſophers have invented theories, in order to throw light upon the proceſs of ſenſation; and to trace the particular manner in which material objects convey impreſſions to our intellectual principle. They have not been leſs deſirous to inveſtigate the mode of action of Perception; but as this faculty is of a ſtill more intellectual and refined nature, it is not to be ſuppoſed that their hypotheſes have been attended with very fortunate reſults. Such hypotheſes, however, have been very prevalent from the remoteſt antiquity; and, contrary to the general courſe of ſuch things, have preſerved a conſiderable uniformity, and been implicitly admitted by ſucceeding philoſophers as a rational baſis of inveſtigation. The conſequence has been, a ſyſtematic diffuſion of error in this branch of ſcience, unparalleled in any other; ſo as at length to be matured into a complete ſyſtem of ſcepticiſm, or diſbelief. Thoſe who wiſh to ſee the gradual progreſs of this ſceptical philoſophy completely developed, are referred to Dr Reid's Second Eſſay on the Intellectual Powers. Our preſent plan requires only a brief ſtatement of the leading opinions of philoſophers concerning the operation of Perception.

The firſt philoſopher, in whoſe writings we find a ſyſtematic theory concerning Perception, is Ariſtotle. According to this theory, Perception, as well as all the other operations of the mind, is carried on by the agency of certain images, forms, or ſpecies of material objects there preſent. The images preſented to our ſenſes were called ſenſible ſpecies, or forms; and were ſuppoſed to be continually ſent off from material objects, in all directions; ſo that, by entering at the avenue of the ſenſes, they produced perception during the day, and dreaming during the night. Theſe images were ſuppoſed to be again preſented to the memory, or imagination, in a more refined ſtate, when they were called Species, ſimply; and when preſented to the intellect in their moſt refined ſtate of all, they were called Phantaſms; and it was maintained, that there can be no perception, memory, or intellection, without ſpecies, or phantaſms.

This theory was well adapted to the Peripatetic philoſophy, which reſolved all the phenomena of the material world into the effects of two principles, called *matter* and *form*. It does not, however, appear to have originated with Ariſtotle; for the followers of Democritus and Epicurus held a ſimilar doctrine with regard to ſlender films of ſubtile matter, which they ſuppoſed to come from external objects. It is likewiſe probable that the Pythagoreans and Platoniſts taught a ſimilar theory of perception; as may be gathered from the hints which Plato gives in the Seventh Book of his Republic, concerning the manner in which we perceive the objects of ſenſe; which he compares to the ſituation of perſons in a deep and dark cave, who ſee not external objects themſelves, but only their ſhadows, by a light let into the cave through a ſmall opening.

The principal difference among theſe ſects, was concerning the origin of the objects of the human underſtanding. According to the Peripatetics, theſe muſt all enter originally by the ſenſes, as ſenſible ſpecies, and are merely refined and rendered more ſpiritual by the intellectual faculties. This doctrine afterwards paſſed into the maxim, 'Nihil eſt in intellectu quod non fuit prius in ſenſu.' Plato, on the other hand, had a very mean opinion of all the knowledge we get by the ſenſes. All ſcience, according to him, muſt be employed about what he called *Ideas*, which are the eternal and immutable patterns of things, which exiſted before the objects of ſenſe themſelves, and are not liable to any change. This doctrine nearly coincides with what the Pythagoreans taught concerning their numbers.

The Peripatetic philoſophy, as is well known, continued to prevail in the world during a period of ſeveral centuries; nor were its metaphyſical doctrines ſucceſsfully oppoſed till the time of Deſcartes. The theory of perception, above detailed, received a conſiderable modification from this philoſopher. He did not, however, totally reject it; for he held it as certain, that it is only a repreſentative picture, form, or ſpecies of an object, that is preſent in the mind when we perceive, and not the object itſelf. But he denied that theſe forms, or ſpecies, are ſent forth from external bodies; and ſhewed the abſurdity of this doctrine by ſolid arguments. He alſo gave the name of *ideas* to the repreſentative forms which he ſuppoſed to be preſent in the mind; a term which he ſeems to have borrowed from the philoſophy of Plato. Another peculiarity in the Carteſian ſyſtem, was the origin which it aſſigned to certain of our ideas, ſuch as thoſe of time, ſpace, motion, &c.; which it repreſented to be innate, or coeval with the mind itſelf.

The Carteſian theory of Perception was variouſly modified by Malebranche, and other ſucceeding metaphyſicians: but it is not neceſſary,

ceſſary, here, to ſpecify the peculiar notions of each. The writings of Mr Locke are juſtly entitled to more conſideration than thoſe of any philoſopher of the period in queſtion. It does not appear that his opinions, concerning perception, differed materially from thoſe of Deſcartes; except in reſpect of the origin which he aſſigned to the repreſentative images, or ideas, as they now were univerſally named. In this reſpect he differed both from the Peripatetics and Carteſians; and aſſigned all our ideas, or notions, to two ſources, viz. 1ſt, Senſation; and, 2d, Reflection or Conſciouſneſs; as we have already had occaſion to ſpecify.

It is an evident conſequence of the doctrine of Perception, as admitted by Deſcartes and Mr Locke, that we have no direct evidence for the exiſtence of external objects, or of a material world; ſince all the objects of our perception and conſciouſneſs are only ideas, or images, which have no dependence whatever upon external things. Both philoſophers were too acute not to perceive this inference; but neither were inclined to give up the exiſtence of a material world, although we have found them, without reluctance, relinquiſhing the independent exiſtence of the ſecondary qualities of body. The arguments, however, by which they endeavoured to eſtabliſh the real exiſtence of matter, are not very ſtrong, and founded chiefly upon this poſition, that a benevolent Supreme power would never have given us faculties like the ſenſes, merely in order to deceive us. *

But

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* Mr Locke has examined, more fully than Deſcartes, the arguments which may be adduced in ſupport of the evidence of the ſenſes. 'As to myſelf,' ſays he (b. 4. c. 11. § 3.) 'I think God has given me aſſurance enough 'of the exiſtence of things without me; ſince, by their 'different application, I can produce in myſelf both 'pleaſure and pain, which is one great concernment of 'my preſent ſtate.' He then ſubjoins four arguments, by

But although we find Deſcartes and Mr Locke conceiving that the exiſtence of a material world is only ſupported by probable arguments, we are ſcarcely prepared for a ſyſtem ſo repugnant to common ſenſe, as poſitively and ſeriouſly to deny the exiſtence of any kind of matter whatever. Yet ſuch was the ſyſtem of the ingenious Biſhop Berkeley, who was conſidered as one of the moſt philoſophical reaſoners of his day. The denial of the exiſtence of the ſecondary qualities of body, but as mere ſenſations

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by which the teſtimony of the ſenſes may be ſupported. The firſt is, Becauſe we cannot have the ideas of ſenſe but by the inlet of the ſenſes. 2d, Becauſe an idea from actual ſenſation, and another from memory, are very diſtinct perceptions. 3d, Pleaſure, or pain, which accompanies actual ſenſation, accompanies not the returning of thoſe ideas, without the external objects. And, 4th, Our ſenſes aſſiſt one another's teſtimony of the exiſtence of outward things (§ 4. 5. 6. & 7.) 'This certainty' (he adds in the following ſections) 'is as great as our condition needs, but reaches no farther than actual ſenſation.'

ſenſations of the mind, which we have ſeen formed a part of the ſyſtems of Deſcartes and Locke, no doubt prepared the way for this ſceptical doctrine; and it was not difficult to extend the arguments, by which the non-exiſtence of the ſecondary qualities of body was ſuppoſed to be proved, to the primary alſo. Theſe, according to the prevailing theory of Perception, were mere ideas or images preſent in the mind; and we know nothing of them but as ideas exiſting in the mind; ſo that of the exiſtence of external bodies we have no evidence. Berkeley ſtates his ſyſtem as a thing very obvious, and readily to be admitted. 'Some truths there are,' ſays he, 'ſo near and 'obvious to the mind, that a man need only 'open his eyes to ſee them. Such I take this 'important one to be, that all the choir of 'heaven, and furniture of earth,—in a word, 'all thoſe bodies which compoſe the mighty 'frame of the world, have not any ſubſiſtence 'without a mind.'

Berkeley, though he denies the exiſtence of a material world, yet, as became his cloth, decidedly eſpouſes the exiſtence of a world of ſpirits. In order to this, he admits that there are certain objects of human knowledge, which are not ideas, but things which have a permanent exiſtence. Theſe are our own minds, and their various operations, other finite minds, and the Supreme mind. And this he thinks muſt follow from the very nature of ideas, which, being inert, paſſive, unthinking beings, cannot be the images of thinking and active beings; of thoſe very beings in which they exiſt.

It was a large ſtride in ſcepticiſm to deny the exiſtence of a material world: but the tenets ſoon after advanced by Mr Hume, and grounded upon the ſame theory of our perceptions, go far beyond this, even to deny the exiſtence of mind, as well as matter. This philoſopher diſtinguiſhes the images, or pictures,

tures, which were ſuppoſed to be the objects of our thoughts, into two claſſes, which he calls impreſſions and ideas; and comprehends under the firſt, all our ſenſations, paſſions, and emotions; and, under the laſt, the fainter copies of theſe, when we remember, imagine, or reaſon concerning them. He ſets out with this as a principle that needed no proof, (and of which, therefore, he offers none), that all the perceptions of the human mind reſolve themſelves into theſe impreſſions and ideas. This being granted, it was eaſy to ſhew, by the ſame proceſs which Berkeley employed to prove the non-exiſtence of matter, that there is neither matter nor mind in the univerſe; nothing but impreſſions and ideas. What we call a body, is only a bundle of ſenſations; and what we call the mind, is only a bundle of paſſions, thoughts, and emotions, without any ſubject: ſo that Mr Hume does not leave us even a ſelf to claim the property of theſe impreſſions and ideas.

The ſyſtem of Mr Hume is not to be conſidered as a mere philoſophical reverie, concerning the manner in which the operations of the mind are conducted; but as a highly dangerous and inſidious attempt to overturn every principle of belief, and rule of conduct. For it admits no other ſtandard by which our opinions and reaſonings are to be guided, than thoſe hypothetical impreſſions, or ideas, which we are to look for within ourſelves. From this ſingular aſſumption, the author endeavours logically to deduce, that there is no ſuch thing as power, or intelligence, in the univerſe; no active cauſe, or voluntary agent; no time or ſpace, matter or mind: In fine, that there is no ſuch thing as evidence, or even probability; nor any reaſon why we ſhould believe one thing, more than its contrary.

Philoſophical ſcepticiſm had now arrived at its utmoſt limits; and it became time to aſſert the privilege of reaſon, and examine upon what foundation doctrines of ſo prepoſterous and dangerous a tendency reſted. Dr Reid has unqueſtionably the merit of being the firſt who ſucceſsfully executed this taſk; and in his various works on the human mind, he has ſo completely accompliſhed it, as to leave little more to ſucceeding writers than to ſelect and illuſtrate his various arguments.

On examining the ground upon which the modern ſceptical ſyſtem reſts, it is found to be nothing more than the hypotheſis which repreſents all our perceptions and thoughts as carried on by means of images or repreſentations of the thing perceived or thought of, preſent in the mind; which images, in modern times, have generally been called *Ideas;* an hypotheſis which, we have ſeen, has deſcended from a very high antiquity, under various modifications. As this theory was taught by the Peripatetics, however erroneous in its aſſumptions, it led to no ſceptical concluſions;

becauſe it taught that the images preſent in the mind were ſent forth by material objects; and, conſequently, ſtill left us the evidence of our ſenſes for the exiſtence of matter. But Deſcartes and his followers, while they retained the ſuppoſition of images in the mind, rejected that of their proceeding from the external body. The conſequence was, that they began firſt with doubting the exiſtence of material ſubſtances, and at length deliberately denied that there is any ſuch thing in the world as matter, or mind, or any ſentient being. 'It 'is pleaſant,' ſays Dr Reid, 'to obſerve, that 'while philoſophers have ſo long been labour'ing, by means of ideas, to explain Perception, 'and the other operations of the mind; thoſe 'ideas have, by degrees, uſurped the place of 'perception, object, and even of the mind it'ſelf, and have ſupplanted thoſe very things 'they were brought to explain.'

It might be reaſonably concluded, that this theory, which has ſo long prevailed in the world, and been ſo implicitly admitted as to ſanction concluſions apparently the moſt abſurd, rendered our notion of perception, as well as the other intellectual faculties, very clear and intelligible. This, however, is by no means the caſe; for if we apply the theory to any other of the ſenſes, except ſight, it is altogether incomprehenſible. I can indeed underſtand what is meant by an image or repreſentation of viſible forms or colours, becauſe I know that ſuch images are painted on the retina of the eye; and this fact ſeems to have afforded the origin of the whole hypotheſis. But what is meant by the image or idea of a taſte, of a ſmell, a ſound, of ſourneſs or ſweetneſs, of loudneſs or lowneſs, of hardneſs or ſoftneſs, I confeſs myſelf perfectly at a loſs to determine. Much leſs can I pretend to underſtand what is meant by the images of intellectual objects, of truth or falſehood, fitneſs or unfitneſs, virtue or vice.

Again, if we ſhould aſk, where are theſe images exhibited, and of what kind of materials are they formed, it would be difficult to obtain an anſwer from thoſe who have moſt ſtrenuouſly eſpouſed the theory. It would ſeem, from the writings of Deſcartes, that he ſometimes places the ideas of material objects in the brain, not only when they are perceived, but when they are remembered or imagined; but at other times he ſays, that we are not to conceive the images or traces in the brain to be perceived, as if there were eyes in the brain; theſe traces being only occaſions on which, by the laws of the union of ſoul and body, ideas are excited in the mind. Mr Locke alſo ſeems to have wavered between theſe two opinions, ſometimes repreſenting the ideas of material things as being in the brain, but more frequently in the mind itſelf. Other philoſophers, among whom we may rank Newton and Dr Clarke, ſpeak of the images of material things as being in that part of the brain called the *ſenſorium*, and perceived by the mind, there preſent; but Newton ſpeaks of this point only incidentally, and, with his uſual modeſty, in the form of a query. As for Berkeley, his ſyſtem leaves no brain on which the images could be traced; and the ſyſtem of Mr Hume leaves neither a brain nor a mind for the reception of his impreſſions and ideas.

As to the particular nature or ſubſtance of the images, philoſophers are generally ſilent. Mr Locke indeed ſays, that our ſenſations are 'produced in us by different degrees and 'modes of motion in our animal ſpirits, va-'riouſly agitated by external objects:' And again, that, by the faculties of memory and imagination, 'the mind has an ability, when 'it wills, to revive them again, and, as it were, 'to paint them anew upon itſelf, though ſome 'with more, ſome with leſs difficulty.' Dr Robert Hook is almoſt the only author who is explicit on this ſubject. He informs us, (*Lect. on Light*, ſect. 7.) that ideas are completely material ſubſtances, and that the brain is furniſhed with a proper kind of matter for fabricating the ideas of each ſenſe. The ideas of ſight, he thinks, are formed of a kind of matter reſembling the Bononian ſtone, or ſome kind of phoſphorus; the ideas of ſound, of ſome matter reſembling the chords or glaſſes which take a ſound from the vibration of the air; and ſo of the reſt. Were this doctrine any thing like the truth, we might reaſonably expect to obtain a view of theſe ideas by a careful diſſection of the brain; which, however, has not yet been found to be the caſe.

What then, it may be aſked, can be the cauſe of the very general reception of an hypotheſis which is replete with ſo many inconſiſtencies and difficulties, inſomuch that it rather obſcures than enlightens the doctrine which it is brought to explain? This ſeems to be aſcribable to a prejudice which is deeply rooted in the human mind, and has even been admitted, from remote antiquity, as a philoſophical axiom, or ſelf-evident principle, namely, that 'nothing can act, or be acted upon, but 'when and where it is preſent.' It ſeems a neceſſary conſequence, from this principle, that when the mind perceives, either the objects of its perception muſt come into it, or it muſt go out of the body to theſe objects. The firſt of theſe opinions has generally been adopted as the moſt rational. 'We ſee,' ſays Malebranche, 'the ſun, the ſtars, and an infinity 'of objects without us; and it is not at all 'likely that the ſoul ſallies out of the body, 'and, as it were, takes a walk through the 'heavens to contemplate all theſe objects.' Yet the author of the Antient Metaphyſics has, among his other ſingularities, eſpouſed this laſt opinion. (See *Ant. Met.* Vol. II. p. 306.)

The origin of this prejudice, that all action is the effect of contact, it is not difficult to aſſign. This is the only manner in which we ourſelves can act upon external objects; and it is the manner in which all our external ſenſes are acted upon by theſe objects, either immediately, or by the intervention of ſome known medium, ſuch as the rays of light, the undulations of the air, or the effluvia of odoriferous bodies. Yet, after all, when we come to examine the matter a little more nearly, we no more underſtand how bodies act upon one another when in contact, than when at a diſtance; and we ſhould never have found out, independently of actual experience, that motion is the effect of contact or impulſe. Nay, if the ſyſtem of Boſcovich be true, there is no ſuch thing as real contact in nature, nor is ſuch a thing poſſible. Again, there are many natural phenomena, ſuch as thoſe of gravitation, magnetiſm, electricity, &c. which appear to be produced by the mutual action of bodies at a diſtance from one another. For though we have various hypotheſes of intervening media, ethers, or effluvia, which are intended to explain theſe phenomena, all theſe are mere ſuppoſitions, deſtitute of the leaſt ſhadow of proof. The inference is, that the maxim above ſtated is to be ranked among thoſe vulgar prejudices which, though very generally received, are without any real foundation in nature.

If we ſeek for any other proof of the ideal theory, in the writings of thoſe who have eſpouſed it, than this generally received prejudice, we ſhall ſeek in vain. They all appear to aſſume the exiſtence of ideas as a thing ſelf-evident, and of which, therefore, no proof will be expected. 'I preſume,' ſays Mr Locke, 'it will be granted me that there are 'ſuch ideas in men's minds; every man is 'conſcious of them in himſelf, and men's 'words and actions will ſatisfy him that they 'are in others.'—'It is evident,' he ſays again, 'the mind knows not things imme-

'diately, but only by the intervention of the 'ideas it has of them.' Berkeley, indeed, infers the reality of ideas from this circumſtance, that magnitude and figure, as perceived by the eye, and as perceived by the touch, are things, in appearance, very different; and Mr Hume employs a ſimilar argument when he ſays, 'The table which we ſee, ſeems to di'miniſh as we remove farther from it; but 'the real table, which exiſts independent of 'us, ſuffers no alteration. It was, therefore, 'nothing but its image which was preſent to 'the mind.' But the known laws of optics are a ſufficient anſwer to ſuch reaſonings, and prove, that tangible magnitude muſt aſſume the preciſe appearances to the eye which it is known to aſſume. There is, in truth, an image in ſuch caſes, but it is not in the mind, but in the retina of the eye.

I have thought it neceſſary to be thus ample in my account of the celebrated theory of ideas, becauſe it has not only pervaded almoſt every ſyſtem of metaphyſics, both ancient and modern, but has even become incorporated with the ſtructure of language itſelf. This renders it difficult, not occaſionally, to employ the term idea, which has become completely naturalized in moſt modern tongues; but I ſhall uſe it with this proviſo, that I mean by it a mere mental notion or conception, without reference to any image, form, or repreſentation, ſuppoſed to be preſent in the mind. *

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* I have taken no notice of the peculiar theory of Leibnitz concerning Perception, which differs more in appearance than in reality from that of Deſcartes, or of Locke. According to Leibnitz, Perception is produced, not by any action of body upon mind, or of mind upon body, which he conceives to be inadmiſſible, but by what he calls the *preestablished harmony.* Our bodies and minds, he conceives, are ſo conſtituted, that each may perform its peculiar operations independently of the other,

but

SECTION II.

Of the Evidence of Perception, or of the Senſes.

HAVING given a pretty ample inveſtigation of the various hypotheſes which philoſophers have entertained on the ſubject of perception, and which are only different modifications of the Ideal Theory, it remains to inquire, what we really know concerning this primary operation of the mind. Here, we are obliged to

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but with a perfect correſpondence or ſympathy, ſo that every change of the one is attended with a correſponding change in the other: juſt as one clock may be ſo adjuſted as to keep time with another, although guided by a perfectly independent moving power. This ſyſtem, it is evident, overturns all the authority of our ſenſes; 'and 'this one thing,' ſays Dr Reid, 'as long as men retain 'their ſenſes, will always make theſe ſyſtems truly ridi'culous.'

to confeſs, that of the peculiar manner in which this faculty is brought into action, we are entirely ignorant, and muſt therefore be contented to ſtate it as an ultimate fact, or law, of the human mind; in the ſame manner as gravitation continues to be ſtated as an ultimate fact, or law, of nature, by the Newtonian philoſophers. We may, however, be able to aſcertain the phenomena which accompany the operation of this ultimate principle; and thus make advances in knowledge, which are the more uſeful and important, that they reſt on the baſis of obſervation, and not of fanciful hypotheſis.

According to Dr Reid (Eſſay II. ch. 5.) 'in every perception of an external object of 'ſenſe, we find theſe three things. 1*ſt*, Some 'conception or notion of the object perceived; '2*dly*, A ſtrong and irreſiſtible belief of its 'preſent exiſtence; and, 3*dly*, That this con-'viction and belief are immediate, and not the

‘ effect of reaſoning.’ We may have a conception of an object without perceiving it; but when we perceive, ſome conception or notion is neceſſarily implied. Again, when the perception is diſtinct, we have an irreſiſtible conviction of the exiſtence of its object. A perception may be ſo faint, as to leave us in doubt of its reality; as when we obſerve the firſt twinkling of a ſtar, or the firſt appearance of a ſhip upon the diſtant horizon: but, when the perception is clear and ſteady, this doubt, with regard to the reality of its object, vaniſhes at once.

Further, this conviction which we have of the preſent exiſtence of the objects of perception is immediate, and not reſolvable into reaſoning, or any other kind of evidence. The rudeſt ſavage is as fully convinced of the reality of what he ſees, hears, and feels, as the moſt expert logician; but both are alike incapable of giving any better reaſon for this belief, than the original conſtitution of their nature. "If, indeed, the knowledge we have of external objects were to be got by reaſoning only, the greateſt part of men would be deſtitute of it; for the greateſt part of men hardly ever reaſon; and in infancy and childhood no man can reaſon: 'Therefore,' continues Dr Reid, 'as this intelligence of the objects 'that ſurround us, and from which we receive 'ſo much benefit or harm, is equally neceſſary 'to children and to men; to the ignorant and 'to the learned: God, in his wiſdom, con'veys it to us in a way that puts all upon a 'level. The information of the ſenſes is as 'perfect, and gives as full conviction to the 'moſt ignorant, as to the moſt learned.'

Upon this account of the phenomena of perception, which is given nearly in Dr Reid's own words, I have only to remark, that the ſecond and third circumſtances in his enumeration may perhaps, with more propriety, be compriſed in one; and then it may be ſaid, that, in every perception of an external object of ſenſe, we find, *1ſt*, Some conception or notion of the object perceived; and, *2dly*, A ſtrong and irreſiſtible belief of its preſent exiſtence, which is not reſolvable into reaſoning, or any other kind of evidence.

The moſt obvious objection to this doctrine, of the immediate and irreſiſtible belief which accompanies perception, ariſes from the opinion, ſo often inculcated by philoſophers, of the fallacy of the ſenſes. Almoſt all the antient philoſophical ſects, Atomiſts, Academics, Peripatetics, and Sceptics, ſtrenuouſly eſpouſed this opinion, and illuſtrated it by many common-place arguments; ſuch as the crooked appearance of a ſtick in the water; objects being magnified, and their diſtance miſtaken in a fog; the ſun and moon appearing but a few inches in diameter, while they are really thouſands of miles; a ſquare tower being taken at a diſtance for a round one; and ſo forth. Theſe, and many ſimilar appearances, they thought were ſufficiently accounted for, by aſcribing them to the fallacy of the ſenſes; which thus ſerved, like the ſubſtantial forms, and occult qualities, as a decent cover for their ignorance. Deſcartes, and moſt of the modern metaphyſicians, have joined in the ſame complaint of the fallacy of the ſenſes; a doctrine which was very ſuitable to that ſyſtem, which repreſented the perfection of philoſophy as conſiſting in doubt.

When we conſider that the active part of mankind, in all ages from the beginning of the world, have reſted their moſt important concerns upon the teſtimony of ſenſe, it will be very difficult to reconcile their conduct with this ſo generally received opinion of the fallacy of the ſenſes. It muſt be acknowledged that our ſenſes are limited and imperfect, liable to injury and miſapplication; but this they have in common with our memory, our judgement, and all our other faculties; and, in many important objects of knowledge, it will be found that we have no other legitimate ſources of information. The fact is, that in many of thoſe inſtances which are called deceptions of ſenſe, the error is not in the information which the ſenſes give us, but in the judgement or concluſion which we deduce from their evidence. Thus, if I miſtake the picture of a cube, or of a ſphere, delineated upon a plane ſurface, for theſe ſolid bodies themſelves: the error is not in the eye; for it has fulfilled its office, by giving me information of the form, colour, apparent magnitude, &c. of the object perceived: but when I deduce from theſe perceptions, that the object perceived is a ſolid, and not a plane, I am guilty of a piece of falſe reaſoning; ſo that, in fact, the fallacy, here, is not in the ſenſes, but in the concluſion of reaſon. But, what places the evidence of the ſenſes in the moſt convincing light is, that it is by their means alone that we are able to detect this fallacy. In the caſe juſt mentioned, we might reaſon for ever, without being able to determine whether we ſaw a plane or a ſolid body; but we can at once ſettle the queſtion, by going ſo near as to ſee its appearance more diſtinctly, or yet more certainly by the help of the ſenſe of touch, whoſe proper province it is to perceive the dimenſion of ſolidity.

The ſame reaſoning may eaſily be applied to other inſtances which are aſcribed to the fallacy of ſenſe. In fact, therefore, the ſource of error, in theſe caſes, is in the faculty of reaſon, which is much more liable to miſtake than the ſenſes are. In the moſt important concerns of mankind, as in trials for life and death, the evidence of ſenſe, that is, of eye and ear witneſſes of veracity, is admitted by the judge as the proper ground of his deciſion. But the *reaſonings* of a counſel are fully weigh-ed, and ſcrutinized, and admitted with much limitation; and if, as Dr Reid remarks, 'a 'ſceptical counſel ſhould plead that we ought 'not to put ſo much faith in our ſenſes as to 'deprive men of life or fortune upon their 'teſtimony,—ſuch an argument would be re'jected with diſdain.' The inference is, that the evidence of ſenſe is perfectly concluſive and unanſwerable. It is therefore ſtronger than that of any kind of reaſoning, except demonſtration; and thoſe ſceptical philoſophers who have ſubſtituted the concluſions of their own hypothetical ſyſtems in the room of the evidence of ſenſe, have been guilty of a complete *paralogism*, or an admiſſion of the leſs evident in room of the more evident.

It may perhaps be aſked, whether there be an evidence or belief accompanying Senſation, as we have endeavoured to prove that belief always accompanies the diſtinct operation of Perception, and alſo of Conſciouſneſs. To this I would anſwer, that our ſenſations and feelings are, like every other thing that paſſes in our own minds, the proper objects of conſciouſneſs; ſo that the conviction which we have of their reality, reſts upon the evidence of that faculty.

CHAPTER FOURTH.

Of Abſtraction.

SECTION I.

General Obſervations upon Abſtraction.

EVERY object which we contemplate in nature, is an individual diſtinguiſhed from all other objects by ſome peculiar characteriſtic properties of its own. But we are endowed with a faculty, by which we contemplate the various qualities of objects apart from the actual aſſemblages of nature. Hence we are enabled to aſcertain what qualities an object has peculiar to itſelf, and what are in common to it and other objects of a like nature, which will therefore be referred to the ſame claſs with it. That faculty by which we analyze the actual aſſemblages of nature into their conſtituent parts, we call Abſtraction. According to the opinion of various philoſophers, the operation by which we refer ſimple qualities to a variety of objects, muſt be aſcribed to another faculty, which they call Generalization; and they conceive that there might have been abſtraction without generalization, though not generalization without abſtraction. Granting this to be true, I conſider the faculty of generalization as nothing other than that which I have called Combination, or Aſſociation, by means of which we connect together the objects of our thoughts, according to various relations, eſſential or accidental, and which we ſhall have to conſider in the next chapter. In the mean time, it will not lead to any material miſapprehenſion, to ſpeak of the whole proceſs of the formation of general notions as due to the faculty of abſtraction alone.

Had we poſſeſſed no ſuch faculty as abſtraction, it is evident that all our knowledge would have been limited to an acquaintance with individual beings and individual facts. But the very eſſence of ſcience conſiſts in generalizing and reducing to a few claſſes, or general principles, the multitude of individual things which every branch of human knowledge embraces. Hence, without abſtraction, ſcience could have had no exiſtence; and the knowledge of man would have been, like that of the lower animals, in whom no traces of this faculty are diſcernible, circumſcribed to an acquaintance with thoſe objects and events in nature with which he was connected by a regard to his own preſervation and well-being.

I do not, indeed, go ſo far as to ſay, with ſome philoſophers, that without abſtraction, the faculty of reaſoning could never have been called into exerciſe; for reaſoning may no doubt be exerciſed upon particular facts and circumſtances; and of this degree of reaſoning the lower animals appear to be capable. A curious example of the reaſoning powers of the monkey is quoted by Mr Stewart (c. 4. ſect. 5.) from the *Lettre ſur les Animaux* of M. Bailly, addreſſed to M. Le Roy: but this faculty, even in the moſt ſagacious animals, is confined within very narrow limits; of which I have heard a convincing proof from a perſon of undoubted veracity. Around Gibraltar, a certain ſpecies of apes is common; and theſe animals are frequently ſeen in herds in receſſes of the rock. They have a particular fondneſs for the heat of a fire, and never fail to aſſemble together around the embers which the centinels leave after boiling their kettles, where they ſeem highly to enjoy themſelves. In the neighbourhood of theſe embers, plenty of chips and fragments of wood are to be found, which ſerve the centinels for fuel; but although the apes are not unfrequently ſeen pelting each other with theſe chips, they have never been known to apply them to feed the expiring fire, whoſe loſs they evidently appear to regret.

It is in the diſcovery of general principles, that reaſon has its nobleſt exerciſe. It is generalization alone that makes it poſſible for us continually to go on in ſcientific improvement. It is in conſequence of this, (as is eloquently obſerved by M. Condorcet *sur l'instruction publique*) ' that at the moment when a multi-' tude of particular ſolutions, and of inſulated ' facts, begin to diſtract the attention, and to ' overcharge the memory, the former gradually ' loſe themſelves in one general method, and ' the latter unite in one general law; and that ' theſe generalizations continually ſucceeding ' one to another, like the ſucceſſive multipli-' cations of a number by itſelf, have no other ' limit than that infinity which the human fa-' culties are unable to comprehend.' (See the whole paſſage tranſlated by Mr Stewart, c. 4.

ſect. 6.) Hence it appears, that abſtraction is completely ſubſervient to all the nobler exertions of reaſon; to thoſe, in particular, by which man has attained the high diſtinction of being denominated a rational animal.

In proportion as a man familiarizes himſelf in the exerciſe of Abſtraction, and accuſtoms himſelf to conſider what are the diſtinguiſhing characteriſtics of the various objects of his contemplation, and what they have in common with others, does he fit himſelf for ſcientific purſuits. But the formation of general principles is not entirely ſuited to the direction of our conduct in the more ordinary occurrences of life. Hence the origin of that maxim, 'which' (as Mr Hume remarks) 'has been 'ſo induſtriouſly propagated by the dunces of 'every age, that a man of genius is unfit for 'buſineſs.' 'When,' ſays Mr Stewart, 'theoretical knowledge and practical ſkill are 'happily combined in the ſame perſon, the 'intellectual power of man appears in its full 'perfection, and fits him equally to conduct, 'with a maſterly hand, the details of ordinary 'buſineſs, and to contend ſucceſsfully with the 'untried difficulties of new and hazardous ſitu'ations.' (See Elem. of the Phil. of the Hum. Mind, c. 14. the whole of § 6. & 7.)

If it ſhould be aſked at what period of life the faculty of Abſtraction ſhews itſelf? Dr Reid anſwers, that as ſoon as a child can ſay, with underſtanding, that he has two brothers, or two ſiſters, that is, as ſoon as he can uſe the plural number, he ſhews himſelf to have formed a general conception. (Eſſay V. c. 3.) Hence it appears, that it is to the faculty of Abſtraction alone, that we owe the notion of *number*, one of the moſt important with which we are acquainted. For if we had not poſſeſſed the faculty of generalizing, or of reducing individual things to various claſſes, we ſhould never have been able to ſay that there were two, or more things of a ſort.

Again, as all language conſiſts, in a great meaſure, of general words or expreſſions which are applicable to more than one individual thing, this valuable prerogative in a great meaſure depends upon the faculty of Abſtraction. If we examine the ſtructure of language, we ſhall find that all its parts of ſpeech are general terms, or may all be applied to a variety of individuals, with the exception of that claſs of ſubſtantive nouns, called *proper names*. Hence, we ſee in how great a degree the faculty of abſtraction facilitates the communication of our thoughts from one to another. And this principle ought to be deciſive of a queſtion, which has not unfrequently been agitated, viz. whether the brutes be capable of acquiring language? Being deſtitute of abſtraction, the only terms in language, whoſe meaning they are capable of comprehending, are the proper names: and this is perfectly agreeable to experience. A dog, or other animal, may be made to anſwer to a particular name; or he may be made to perform certain individual acts when certain ſounds are pronounced to him: but further than this, in reſpect to the comprehenſion of words, his intellectual powers appear to be incapable of carrying him.

Few ſubjects have given riſe to more controverſy, among metaphyſical writers, than the queſtion concerning the particular intellectual proceſs by which the mind forms general notions; or, in other words, what is the object of our thoughts when we employ an abſtract or general term. This queſtion has become very much implicated with the ideal theory which ſo long prevailed in the world, and according to which, as already ſtated, (c. 3. ſect. 1.) there is ſome image or ſenſible repreſentation of every object of thought preſent in the mind, when any of our faculties are employed about that object. It therefore became a queſtion, what is the nature of the *images*, or *ideas* of abſtraction; and are theſe mere creatures of the mind, or have they a real and permanent exiſtence in nature?

It was the doctrine of Plato, as well as of the Pythagorean ſchool, that *univerſal ideas* were of an eternal and immutable nature, and were the general repreſentations of what the objects of our ſenſes exhibited only as individuals. (See as above.) Hence, it is evident that theſe philoſophers aſſigned to *abſtract ideas*, or *univerſals*, as they were called, a real and permanent exiſtence; and indeed conſidered them as the only objects of true ſcience. Ariſtotle, who derived ideas from matter, inſtead of matter from ideas, ſtill admitted that univerſal ideas were things actually preſent in the mind; although he denied them an independent and permanent exiſtence. It is to him we owe the diviſion of univerſals into five claſſes, *viz.* genus, ſpecies, ſpecific difference, property, and accident; which, however, Dr Reid is of

opinion,

opinion, was borrowed from the Pythagorean ſchool. Thus, we may conclude, that Plato and Ariſtotle, as well as the Pythagoreans, all concurred in aſcribing a real exiſtence to univerſal ideas, although they differed as to their origin: but a very oppoſite doctrine appears to have been taught by Zeno and the Stoics, *viz.* that univerſals have no real exiſtence, but are mere creatures of the human mind.

The obſcure ſtatement of this controverſy, in Porphyry's Introduction to the Categories of Ariſtotle, appears to have drawn the attention of the ſchoolmen to it very early in the middle ages. The prevailing opinion was, the reality of univerſals, in conformity to the doctrine of Ariſtotle; but the ſyſtem of the Stoics was revived, or rather reinvented, in the eleventh century, by Roſcelinus, and found a very able and eloquent defender in his diſciple the celebrated Peter Abelard, as well as, afterwards, in the Engliſh ſchoolman William Occam,

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a diſciple of Duns Scotus. The controverſy was agitated with the greateſt keenneſs, and not without blows and bloody affrays. Thoſe who eſpouſed the reality of the exiſtence of univerſals, were called *Realists;* and thoſe who maintained the oppoſite doctrine, were called *Nominalists.* A few took a middle courſe; and aſſerted that univerſality was neither in things nor in names, but in our conceptions; whence they were called *Conceptualists.*

Thoſe modern philoſophers who have eſpouſed the theory of ideas, have generally given up the opinion of the Realiſts. Mr Hobbes was a decided Nominaliſt; as were alſo Dr Berkeley and Mr Hume. Mr Locke, in the opinion of Dr Reid, was a Conceptualiſt; although it is not very eaſy to aſſign a diſtinct notion to this doctrine, in conjunction with the ideal theory; for, according to that theory, our conceptions are themſelves real beings, *viz.* nothing other than ideas themſelves; ſo that it would ſeem that a Conceptualiſt, who believed in the ideal theory, muſt be a Realiſt, at leaſt in ſo far as the real exiſtence of univerſals was taught in the Peripatetic ſyſtem. The hiſtory of the controverſy may be ſeen clearly ſtated in Dr Reid's Eſſays on the Intellectual Powers (Eſſay V. c. 6.), as well as in Mr Stewart's Elements of the Philoſophy, &c. (c. 4. ſect. 2. & 3.); and ſtill more amply in Bruckeri Hiſt. Phil. (vol. III.)

If the ideal theory be relinquiſhed, as I think it muſt, in conſequence of the reaſonings of Dr Reid, the ſyſtem of the Realiſts falls to the ground, or at leaſt becomes identified with that of the Conceptualiſts; for I do not ſuppoſe that any philoſopher would now be inclined to revive the ſyſtem of Plato concerning the eternal and independent exiſtence of univerſal archetypes, or ideas, after the patterns of which all individual things have been formed, ed. The only rational controverſy, that now remains, appears to be, Whether is the mind capable of attaching diſtinct notions, or conceptions, to thoſe general and abſtract terms which it ſo frequently employs? or is it incapable of forming ſuch notions, ſo that, when it employs general terms, theſe are to be conſidered rather as ſigns than accurate expreſſions of our thoughts, and if any diſtinct notion is annexed to them, it muſt be that of an individual of the ſpecies which they are employed to expreſs?

This queſtion appears ſtill to divide the opinions of Intellectual philoſophers; and on this account, as well as becauſe of its real importance in ſettling the firſt principles of knowledge, it deſerves a particular examination. We may conſider Dr Reid as having maintained the firſt opinion; and Mr Stewart as one of the ableſt advocates for the ſecond. A variety of ingenious arguments for this laſt doctrine, are likewiſe to be found in the writings of the Abbé de Condillac. After all that has been ſaid upon the ſubject by theſe able philoſophers, perhaps ſome new lights remain to be thrown upon it by inquirers of far leſs eminence. With a view to avoid the errors attendant upon theoretical ſpeculation, I ſhall, in the ſhort inveſtigation of this queſtion, which forms the next ſection, follow, as much as I am able, the natural order of induction grounded upon the progreſſion of facts.

SECTION II.

Of the Nature and Origin of Abſtract and General Terms.

THE moſt general diviſion of the objects of human thought, or of thoſe things which language is intended to denote, is into *sub-*

ſtances and *attributes;* for every thing which exiſts, or of which we can form a notion, muſt be either an individual being or ſubſtance; or elſe ſome quality, relation, or mode of operation, that is, ſome attribute of that ſubſtance. In all languages yet diſcovered among the various tribes of men, the firſt claſs of notions is expreſſed by certain words, which, from their office, have been called ſubſtantive nouns. The ſecond claſs, which is by far the moſt complicated, and aſſumes a great variety of forms, is expreſſed by words which have, in proceſs of time, come to be arranged under different genera; for attributes are expreſſed by adjective nouns, by verbs, participles, adverbs, and all the indeclinable parts of ſpeech, and alſo by many ſubſtantive nouns.

It has been rendered exceedingly probable, by the philological inveſtigations of Mr Horne Tooke, that language, in its primitive form, conſiſted almoſt entirely of nouns and verbs;

ſince he has been able to ſhew, in the caſe of the Engliſh language, and, occaſionally, in particular examples of other languages, that all the indeclinable parts of ſpeech, which have given ſo much trouble to grammarians, may be reduced to ſome form or other of the noun or verb, either exiſting in the language itſelf, or in thoſe dialects from which it was originally derived. This renders it probable that, in every caſe whatever, this reduction might be made, were we acquainted with all the roots of the language in queſtion.

Without both the noun and verb, ſcarce any thought can be intelligibly expreſſed; for the noun is neceſſary to denote the ſubject of our thoughts, and the verb to denote its particular ſtate, or that which we wiſh to affirm or expreſs concerning it. The utterance of a name alone, accompanied with ſome indicatory geſtures of the body, may be ſufficient, on ſome few occaſions, to convey our meaning to others: and we find, in certain languages, a few forms of expreſſion, which, by means of the verb alone, contain a complete affirmation; as in the Latin—*pluit*, *it rains*; *pugnabatur*, *there was a battle*; and ſome others. But, in general, it may be aſſumed as a manifeſt truth, that both the noun and verb are neceſſary for the communication of thought, even in the rudeſt ſtate of language; the one to denote the object of our thoughts; the other, that relation or attribute which we expreſs concerning it.

The verb, as it is found in all languages, includes, in its more uſual forms, not only the expreſſion of ſome particular ſtate or action, but alſo the notion of time, denoted by its tenſe, together with other notions which it is not neceſſary here to ſpecify. Hence the neceſſity of another ſet of words which ſhall denote the more permanent attributes of ſubſtances, without reference to the preſent, paſt, or future; or ſhall include in them nothing more than the ſimple notion of the attribute itſelf. Theſe words are the *adjectives*, whoſe purpoſe it is, ſimply to denote the various permanent qualities of ſubſtances, ſuch as *white*, *green*, *rough*, *ſmooth*, *good*, *bad*, *&c.*; and which are neceſſarily of a very high antiquity in language. It has been ingeniouſly ſuppoſed, that many of the adjectives were at firſt nothing more than the names of thoſe ſubſtances which poſſeſſed much of the quality which they were employed to denote. Thus, it would be natural to ſay, the 'ſnow cloth,' to denote the white cloth; the 'graſs cloth,' to denote the green cloth; and ſo forth: a form of expreſſion which we ſtill retain, in ſuch examples as the words *violet*, *orange*, *&c.* which are employed both as ſubſtantives and adjectives. Others of the adjectives are evidently derived from verbs; as *learned*, from *to learn*; *hot*, from *to heat*; which is more manifeſt in the inſtance of *calidus*, from *caleo*; and ſo forth: and, perhaps, ſome can ſcarcely be traced to either origin, but muſt be referred to the original ſtock of words.

The adjectives are employed with propriety only when conjoined with ſubſtantives, as their very name imports. Hence the origin of a ſet of ſubſtantives which have been termed abſtracts, intended to denote a quality or attribute, without any relation whatever to a ſubſtance. Thus, from *good*, we have *goodneſs*; from *white*, *whiteneſs*; and ſo forth: while, in ſuch inſtances as *green*, *blue*, &c. one word ſerves the purpoſe of both ſubſtantive and adjective. Many of theſe abſtracts are derived from verbs; ſuch as *puniſhment*, from *puniſh*, *underſtanding*, from *underſtand*, &c.; while in ſome inſtances here, alſo, one word anſwers both purpoſes, as in the words *love*, *walk*, &c. It is an obſervation of M. de Condillac, (Sur l'Origine des Con. Hum. part. 2. § 1. c. 9.) 'that all the abſtract ſubſtantives are derived

‘ from ſome adjective or verb; and, in common language, owe their origin merely to ‘ the neceſſity of expreſſing the thoughts commodiouſly.’ *

Let us now pauſe, and aſk, Have we diſtinct conceptions attached to the various claſſes of words which we have juſt enumerated? I think it cannot be doubted that we are capable of forming ſuch conceptions. What it is *to walk*, *to run*, *to have walked*, or *to command to walk;* what it is *to love* or *to hate*, *to be angry* or *to pity*,—all which are examples of the verb; ſurely we as diſtinctly comprehend, as what is meant by the ſpecific name of any tree, mountain, or river, ſuch as *aſh*, *Snowdon*, or *Thames*. Certainly, too, we have an equally ly diſtinct conception, when we ſay, the aſh is *green*, or it is *ſmooth*, or it is *crooked;* which are examples of the adjective: and I think there is no difficulty in annexing a diſtinct meaning to the abſtracts, *ſmoothneſs*, *crookedneſs*, *&c.* although we are perfectly aware that theſe cannot exiſt, and, therefore, cannot be figured viſibly before the eyes, without ſome ſubſtance that ſhould be *ſmooth* or *crooked.* But, ſurely, a diſtinct mental conception is one thing, and an ocular repreſentation, or viſible painting, is another.

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* ‘ Si nous pouvions remonter à tous les noms primitifs, nous reconnoîtrions qu'il n'y a point de ſubſtantif abſtrait qui ne dérive de quelque adjectif ou de ‘ quelque verbe.’

The doctrine which I have been endeavouring to illuſtrate, appears to coincide with what is ſaid concerning our notions of attributes by Dr Reid, (Eſſay V. on the Intellectual Powers, c. 2.) ‘ It appears,’ ſays he, ‘ from ‘ every man's experience, that he may have ‘ as clear and diſtinct a conception of ſuch ‘ attributes as we have named, and of innu‘ merable others, as he can have of any indi-

'vidual to which they belong.' 'Indeed,' adds he, 'the attributes of individuals is all 'that we diſtinctly conceive about them. It 'is true, we conceive a ſubject to which the 'attributes belong; but of this ſubject, when 'its attributes are ſet aſide, we have but an 'obſcure and relative conception, whether it 'be body or mind.'

'The other claſs of general terms,' adds he afterwards, 'are thoſe that ſignify *genera* 'and *ſpecies*, into which we divide and ſub-'divide things;' and of theſe I come now to treat. 'If we are able,' ſays Dr Reid, 'to form diſtinct conceptions of attributes, it 'cannot ſurely be denied that we may have 'diſtinct conceptions of genera and ſpecies, 'becauſe they are only collections of attributes 'which we conceive to exiſt in a ſubject, and 'to which we give a general name. If the 'attributes comprehended under that general 'name be diſtinctly conceived, the thing

' meant by the name muſt be diſtinctly con-
' ceived: and the name may juſtly be attri-
' buted to every individual which has thoſe
' attributes.' 'Thus,' adds he, 'I may con-
' ceive diſtinctly what it is to have wings; to
' be covered with feathers; to lay eggs. Sup-
' poſe, then, that we give the name of *bird* to
' every animal that has theſe three attributes.
' Here, undoubtedly, my conception of a bird
' is as diſtinct as my notion of the attributes
' which are common to this ſpecies.' From theſe paſſages, the opinion of this philoſopher, concerning the origin and nature of generic terms, appears pretty clearly to have been, that we firſt form notions of the ſeparate attributes belonging to a claſs or genus, for which names would naturally be aſſigned, and that we combine theſe attributes into one complex notion, to which we give a generic appellation, common to all the individuals of the claſs or genus. This opinion does not appear to me ſtrictly conformable to the proceſs of diſtinct mental conception,

conception, nor to the natural progreſs of language; for generic terms are manifeſtly of a very early origin, and greatly precede, in the order of time, the names of many of thoſe attributes which ought, according to this account of the matter, to have been had in view when the generic terms were invented.

The ingenious Abbé de Condillac, in his ſmall treatiſe entitled *La Logique*, appears to me to have well illuſtrated the natural origin of generic terms. ‘ When,’ ſays he, ‘ we ‘ ſhew a child a tree, and tell him that it is ſo ‘ named, the word tree will be to him the ‘ name of an individual object. Nevertheleſs, ‘ if we ſhew him another tree, he will not ‘ think of demanding its name, but will call ‘ it a tree; and thus he will proceed with a ‘ third, and a fourth, &c. object of the ſame ‘ kind. Nay, ſo ſerviceable will this term become to him, that he will call trees all that ‘ we comprehend under the term plants.

'Thus is he naturally led to generalize, be-'cauſe it is more convenient for him to make 'uſe of a name which he has learnt, than to 'employ a new one. He generalizes, there-'fore, without being at all conſcious that he 'does ſo. The ſame regard to convenience, 'however, which prompted him to generalize, 'will alſo induce him to form ſubordinate 'claſſes. Thus, if we conduct him into a 'garden, and give him different fruits to eat, 'he will ſoon learn the terms, cherry-tree, 'plum-tree, apple-tree, &c. and will be in-'clined afterwards to make uſe of them. 'Thus men form genera, and again ſubdi-'vide them, without at all thinking of the 'matter.' *

Mr

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* Un enfant nommera *arbre* d'après nous, le premier 'arbre que nous lui montrerons; et ce nom ſera pour lui 'le nom d'un individu. Cependant, ſi on lui montre un 'autre arbre, il n'imaginera pas d'en demander le nom: il

Mr Smith, in his Diſſertation on the Origin of Languages, gives a ſimilar account of the extenſion of individual names to whole claſſes of objects; and the hypotheſis appears to be equally ſimple and ſatisfactory. I am, however, by no means inclined to acquieſce in the concluſions

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le nommera *arbre*, et il rendra ce nom commun à deux individus. Il le rendra de même commun à trois, à quatre, et enfin à toutes les plantes qui lui paraîtront avoir quelque reſſemblance avec les premiers arbres qu'il a vus. Ce nom deviendra même ſi général, qu'il nommera *arbre* tout ce que nous nommons *plante*. Il eſt naturellement porté à généraliſer, parce qu'il lui eſt plus commode de ſe ſervir d'un nom qu'il ſait, que d'en apprendre un nouveau. Il généraliſe, donc, ſans avoir formé le deſſein de généraliſer, et ſans même remarquer qu'il généraliſe. Il ne fera qu'obéir à ſes beſoins. C'eſt pourquoi, je dis, qu'il fera ſes diſtributions naturellement, et à ſon inſçu. En effet, ſi on le mene dans un jardin, et qu'on lui faſſe cueillir et manger différentes ſortes de fruits, nous verrons qu'il apprendra bientôt les noms de ceriſier, pêcher, poirier, pommier, et qu'il diſtinguera différentes eſpèces d'arbres.' (*La Logique*, prim. partie, c. 4.)

conclufions which have been drawn from it, by M. de Condillac, as well as by Mr Stewart and others, *viz.* that generic terms are mere ſigns of convenience, which we acquire the habit of employing with accuracy, but to which no diſtinct notion can be annexed. The following paſſage, (from Elements of the Philoſophy of the Human Mind, c. 4. § 3.) appears to contain the moſt diſtinct expoſition of Mr Stewart's ſentiments on this ſubject. 'Still, 'however, it may be urged that, although, 'in ſuch caſes, there ſhould be no object of 'thought in the mind, there muſt exiſt ſome-'thing or other to which its attention is 'directed. To this difficulty I have no an-'ſwer to make, but by repeating the fact 'which I have already endeavoured to eſta-'bliſh; that there are only two ways in which 'we can poſſibly ſpeculate about claſſes of 'objects; the one, by means of a word, or 'generic term; the other, by means of one par-'ticular individual of the claſs, which we con-

‘ ſider as the repreſentation of the reſt; and ‘ that theſe two methods of carrying on our ‘ general ſpeculations, are, at bottom, ſo much ‘ the ſame, as to authoriſe us to lay down as ‘ a principle, that, *without the uſe of signs, all* ‘ *our thoughts must have related to individuals.* ‘ *When we reason, therefore, concerning classes* ‘ *or genera, the objects of our attention are mere*‘*ly signs;* or if, in any inſtance, the generic ‘ word ſhould recal ſome individual, this cir‘cumſtance is to be regarded only as the con‘ſequence of an accidental aſſociation, which ‘ has rather a tendency to diſturb, than to ‘ aſſiſt us in our reaſoning.’ ‘ Whether,’ adds Mr Stewart, ‘ it might have been poſſible ‘ to have ſo formed us, that we might have ‘ been capable of reaſoning concerning claſſes ‘ or genera of objects, without the uſe of ſigns, ‘ I ſhall not take upon me to determine. But ‘ this we may venture to affirm, with confi‘dence, that man is not ſuch a being.’

In oppoſition to this ingenious philoſopher, I take upon me to affirm, that *man is ſuch a being*; and that, though generic terms are very convenient and uſeful ſigns, both for communicating our thoughts, and giving them preciſion, they are by no means indiſpenſably requiſite for enabling us to ſpeculate concerning general claſſes of objects. Thus, I think, though language had contained no ſuch generic term as *man*, we might have entered into many very uſeful ſpeculations concerning the whole human race: and, in like manner, though we had wanted the words *plant* and *mineral*, we ſhould not have been entirely ignorant of the general properties of the vegetable and foſſil kingdoms. Nay, I maintain, that we are actually without ſuch generic terms, in many departments where ſcientific ſpeculation has been moſt ſucceſsfully conducted. Thus, I know of no term, in any language, that properly defines and comprehends the objects of aſtronomical ſcience. The term *ſtars*, excludes the ſun and moon, and perhaps the planets and comets; and hence, in giving a brief explanation of the objects of this ſcience, we are obliged to make uſe of a circumlocution, viz. *the heavenly bodies.* But certainly a circumlocution is not *a term*, but a clumſy ſubſtitute for one, which neceſſity prompts us to employ. I would likewiſe obſerve, that the ſenſe in which generic terms are underſtood, is by no means fixed and preciſely limited; ſo that to one perſon they may indicate all the individuals of a certain ſubject of ſpeculation, while to another their meaning may be more circumſcribed. Thus, many writers upon Pneumatology employ the term *mind*, as comprehending not only the intellectual part of man, but alſo the Divine mind, and every ſpiritual being; while others limit it to the human mind alone; and are, therefore, without any generic appellation for all the objects of this ſcience. The concluſion I would deduce from theſe illuſtrations, is, that generic terms, though extremely uſeful and convenient, are by no means eſſential to general ſpeculations, or to the formation of general notions.

The next point which it is of importance to examine, is, When we reaſon concerning claſſes or genera, are the objects of our attention ‘ merely ſigns?’ that is, have generic terms any diſtinct ſignification, of which a clear conception can be formed, or not? And here, too, I muſt diſſent from the doctrine laid down by Mr Stewart; for I cannot conceive in what manner accurate reaſonings can be carried on, or ſpeculation ſucceſsfully purſued, by means of terms to which we are incapable of annexing a diſtinct meaning; inſomuch, that when caſual aſſociation does lead us to annex ſome meaning to them, *viz.* that of an individual of the claſs which they denote, this ‘ has rather a tendency to diſturb, than to ‘ aſſiſt us in our reaſoning.’

The meaning that, according to my appreſion, is attached to a generic term, is an incluſive notion of all the individuals which that term is intended to comprehend. Thus, the word *tree* includes in its meaning all thoſe vegetables to which that name is uſually applied; the word *man* comprehends all the individuals of the human race; and ſo forth. This account of the matter is perfectly agreeable to the origin of theſe terms, as above detailed, where we find a name ſucceſſively applied to a variety of individuals, on account of a general reſemblance obſerved among them; and conſequently, when the name comes to be again employed, the mind naturally attaches to it the notion, not of one, but of many individuals.

Here, perhaps, it may be objected, that the mind is incapable of forming a notion of ſuch a multiplicity of individuals as muſt, according to this account of the matter, be conceived to be attached to generic terms. But, in reply to this objection, I would aſk, are we capable of diſtinctly comprehending what is meant by the term *forest*, for example? And I ſuppoſe it will be granted that we are; in thus far, at leaſt, that we underſtand, by it, a great collection of trees; although it would be abſurd to ſuppoſe that any definite number of trees muſt be thought of when we uſe the term. Preciſely of the ſame kind, I conceive to be the notion which we attach to the term *tree*, viz. an indefinite number of that kind of plants to which the name can be properly applied. Hence, I would deſcribe the notion which the mind attaches to a generic term, to be a general indefinite notion of the various individuals to which the term extends.

Thus, generic terms, though uſually ſingular in form, are really plural in ſignification; or, as the logicians expreſs it, are *complex in sense, but not in words;* and this circumſtance ſeems to have been one conſiderable cauſe of the miſconception of their meaning, which has ſo generally prevailed among metaphyſicians. Thus, Dr Reid, in the paſſages above quoted from his 5th Eſſay, repreſents a general conception as an individual thing, formed of a combination of the various characteriſtic attributes of the claſs of things to which it applies. If, however, we try to form ſuch a conception as this, we are of neceſſity obliged to turn the attention to ſome one individual of the claſs in queſtion; and this appears to furniſh the ſtrongeſt argument for the Nominal doctrine, or that which reduces generality to a mere term. This argument is very clearly ſtated in the following paſſage of Mr Hobbes's Tripos. 'The univerſality of one name to 'many things, hath been the cauſe that men 'think the beings themſelves are univerſal; 'ſo, ſeriouſly contend, that beſides Peter and 'John, and all the reſt of the men that are, 'have been, or ſhall be in the world, there is 'yet ſomething elſe, that we call Man, *viz.*

'man in general; deceiving themſelves, by 'taking the univerſal, or general appellation, 'for the thing it ſignifieth.' (c. 5. § 6.) I am very ready to grant, that the mind is as incapable of conceiving this individual *man* in the abſtract, as the painter would be to delineate him; but I ſee no difficulty in conceiving an indefinite collection of individuals whom we call *men.* *

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* Mr Locke appears fully aware of the difficulty here ſtated, yet is not deterred, by it, from maintaining the *individuality* of the notion attached to a general term. 'When,' ſays he, (b. 4. c. 7. § 9.) 'we nicely reflect 'upon them, we ſhall find that general ideas are fictions 'and contrivances of the mind, that carry difficulty with 'them, and do not ſo eaſily offer themſelves as we are 'apt to imagine. For example, does it not require ſome 'pains and ſkill to form the general idea of a triangle, '(which is yet none of the moſt abſtract, comprehenſive, 'and difficult); for it muſt be neither oblique, nor rect-'angle, neither equilateral, equicrural, nor ſcalenon; 'but all, and none, of theſe at once? In effect, it is 'ſomething

In various inſtances of generic terms, the plural form may be employed as well as the ſingular; and then the plurality of ſignification

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'ſomething imperfect, that cannot exiſt; an idea, where-'in ſome parts of ſeveral different and inconſiſtent ideas 'are put together.'

Dr Cudworth appears to have been fully aware of the incompetency of the Nominal doctrine; and, in the following paſſage of his Intellectual ſyſtem, ſtrongly cenſures the opinion of Hobbes above quoted. 'It is a 'ridiculous conceit,' ſays he, (p. 731.) 'of a modern 'atheiſtical writer, that univerſals are nothing elſe but 'names, attributed to many ſingular bodies, becauſe 'whatever is, is ſingular. For, though whatſoever exiſt 'without the mind be ſingular, yet it is plain that there 'are conceptions in our minds, objectively univerſal. 'Which univerſal objects of our mind, though they ex-'iſt not as ſuch any where without it, yet they are not, 'therefore, nothing, but have an intelligible entity, for 'this very reaſon, becauſe they are conceivable; for, 'ſince nonentity is not conceivable, whatſoever is con-'ceivable, and an object of the mind, is therefore ſome-'thing.'

tion is more apparent. Thus, we may ſay, 'Man is mortal,' or 'All men are mortal;' and the meaning of both phraſes is evidently the ſame; while it appears manifeſt, that the object of our thoughts, in the ſecond inſtance, includes many individuals. This, perhaps, appears more plainly in the caſe of words which are leſs general in their application, as in thoſe which denote the ſubordinate claſſes of men. Thus, when we ſpeak of certain qualities belonging to *the European*, it is pretty manifeſt that the object of our thoughts is the whole inhabitants of Europe; juſt as much as if we were to ſay that the qualities belong *to Europeans in general.* Thus, too, we certainly think of all the inhabitants of France, whether we ſay *the Frenchman*, or *Frenchmen*, or *the French*; and ſo in other inſtances.

The concluſion that I wiſh to eſtabliſh, from all that has been ſaid, is; that general terms are not to be conſidered as mere ſigns, or words, to which we are incapable of annexing any diſtinct ſignification; but that the mental conception, of which they are the ſign, is ſufficiently intelligible. It is not, however, a ſingle object of thought, made up of a collection of attributes; but a general indefinite notion of the various individuals to which the generic term may be applied.

SECTION III.

Of the Ambiguity of General and Abstract Terms.

As general terms are introduced into language, merely from the ſuggeſtions of neceſſity, or convenience, their meaning, in many caſes, may not be preciſely fixed; which naturally gives riſe to a miſuſe, or miſapprehenſion of them. ‘ It is ſaid to have been ſome‘ times a matter of diſpute, ’ ſays Dr Reid, (Eſſay 5th on the Intellectual Powers, c. 2.) ‘ with regard to a monſtrous birth of a wo‘ man, whether it was a man or not. Al‘ though, ’ adds he, ‘ this be, in reality, a ‘ queſtion about the meaning of a word, it ‘ may be of importance, on account of the ‘ privileges which laws have annexed to the ‘ human character. To make ſuch laws per‘ fectly preciſe, the definition of a man would ‘ be neceſſary, which I believe legiſlators have ‘ ſeldom or never thought fit to give. ’ In fact, it will be found, upon examination, that ſcarce any of the generic terms, which have been introduced by common uſage into language, have ſo much preciſion as to prevent all ambiguity of ſignification. It is the buſineſs of ſcience, as it advances, to fix and define their preciſe meaning, and to ſupply the places where they are deficient by the invention of new terms, or technical expreſſions, which ſhall accurately denote the various departments of being which form the objects of its inveſtigation.*

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* 'Ce n'eſt pas aux philoſophes,' ſays *Helvetius*, 'c'eſt au beſoin qu'on doit l'invention des langues; et 'le beſoin en ce genre n'eſt pas difficile à ſatisfaire. En 'conſequence, on a d'abord attaché quelques fauſſes idées 'à certains mots; enſuite on a combiné, comparé ces 'idées et ces mots entre eux, chaque nouvelle combinaiſon a produit une nouvelle erreur; ces erreurs ſe 'ſont multipliées, et en ſe multipliant, ſe ſont tellement 'compliqués, qu'il ſeroit maintenant impoſſible, ſans une 'peine et un travail infinis, d'en ſuivre, et d'en decouvrir 'la ſource. Il en eſt des langues comme d'un calcul 'algebrique; il s'y gliſſe d'abord quelques erreurs; ces 'erreurs ne ſont point apperçus; on calcule d'après ſes 'premiers calculs, de propoſition en propoſition; l'on arrive à des conſequences entièrement ridicules. On en 'ſent l'abſurdité; mais comment retrouver l'endroit où 's'eſt gliſſé la premiere erreur? Pour cet effet, il faudroit refaire et vérifier un grand nombre de calculs; 'malheureuſement, il eſt peu de gens qui puiſſent l'entreprendre,

It has been univerſally admitted, that one of the great cauſes of the clearneſs and certainty of the ſcience of Mathematics, is the accuracy and preciſion of its terms: which have their meaning ſettled by diſtinct definition, and poſſeſs the peculiar advantage of being ſolely appropriated to the objects of that ſcience; and conſequently are free from all ambiguity. The ſcience of Algebra is juſtly accounted the moſt extenſively uſeful of all the branches of the Mathematics; which, though chiefly aſcribable

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'treprendre, encore moins qui le veuillent, ſurtout, 'lorſque l'interêt des hommes s'oppoſe à cette vérification.' *De l'Eſprit*, Diſc. 1. ch. 4.

'Il eſt peu de mots abſtraits dans les langues ſauvages,' ſays the ſame philoſopher, 'et beaucoup dans 'celles des peuples policés. Ces derniers intereſſés à 'l'examen d'une infinité d'objets, ſentent à chaque inſtant le beſoin de ſe communiquer nettement et rapidement leurs idées; c'eſt à cet effet qu'ils invitent tant de 'mots abſtraits; l'étude des ſciences les y neceſſite.' *De l'Homme*, ſect. 8. ch. 19.

to its wonderful analytical reſources, is no doubt due, in part, to the ingenuity and extenſive application of its language, or, as it is uſually expreſſed, of its characters and ſigns; which are ſo contrived, that by means of a few letters and ſimple marks, the meaning of many ſentences may be at once conveyed, and afterwards diſtinctly developed, although thoſe ſymbols have been ſubjected to a variety of numerical proceſſes.

Mr Stewart appears to conſider the characters of Algebra as affording one of the ſtrongeſt confirmations of the ſyſtem of Nominaliſm; *i. e.* as a ſyſtem of ſigns, 'which, from their 'generality, have no tendency to awaken the 'powers of conception and imagination.' And he ſubjoins, that 'the perfection of phi-'loſophical language, conſidered either as an 'inſtrument of thought, or as a medium of 'communication with others, conſiſts in its 'approaching, as nearly as poſſible, in its na-

'ture, to the language of Algebra.' (Elem. &c. c. 4. ſect. 3.) The algebraic ſymbols are doubtleſs of very general application; but I cannot help thinking that their meaning admits of being very preciſely defined. Thus, I conceive the import of the letters *a*, *b*, *c*, *d*, &c. which it employs, to be quantity, (*i. e.* what is ſuſceptible of being numbered, or meaſured with accuracy), conſidered in general, or according to ſome particular limits pointed out by the terms of the problem; + denotes addition; — ſubtraction; and ſo on. And if we ever wholly loſe ſight of theſe ſignifications during an analytical proceſs, the certainty of the reſult is nothing diſſimilar to what happens in other caſes of practical facility, which have uſually been explained by a recourſe to the principle of habit, and of which the real nature has been ſo philoſophically explained by Mr Stewart himſelf, (Elem. &c. c. 2.) I do not think that the nature of ſyllogiſm affords an argument in any degree more ſatisfactory in ſupport of the ſyſtem of Nominaliſm. 'In 'the following ſyllogiſm,' ſays Mr Stewart, (Elem. &c. c. 4. ſect. 3.) "All men muſt "die: Peter is a man; therefore, Peter muſt "die"—the evidence of the concluſion does not 'in the leaſt depend on the particular notions 'I annex to the words *man* and *Peter;* but 'would be equally complete, if we were to 'ſubſtitute, inſtead of them, two letters of the 'alphabet, or any other inſignificant characters. "All x's muſt die: z is an x; therefore, z muſt die," is a ſyllogiſm which forces the aſſent no leſs than the former. It is 'farther obvious that this ſyllogiſm would be 'equally concluſive, if, inſtead of the word '*die*, I were to ſubſtitute any other verb that 'the language contains; and that, in order to 'perceive the juſtneſs of the inference, it is 'not even neceſſary that I ſhould *underſtand* '*its meaning*. In general,' adds he, 'it might 'be eaſily ſhewn, that all the rules of logic, 'with reſpect to ſyllogiſm, might be demonſtrated,

'ſtrated, without having recourſe to any thing 'but letters of the alphabet; in the ſame man'ner (and, I may add, on the very ſame 'principle) on which the algebraiſt demon'ſtrates, by means of theſe letters, the various 'rules for tranſpoſing the terms of an equa'tion.'

Though I by no means admit that it is not neceſſary to *underſtand the meaning* of a ſyllogiſm, in order to perceive the juſtneſs of its inference, yet, without doubt, our aſſent will be given to a ſyllogiſm, although its terms be ſucceſſively varied, according to a certain principle. Of this, the reaſon is ſatisfactorily aſſigned by Mr Stewart afterwards, *viz.* that 'in 'every ſyllogiſm, the inference is only a par'ticular inſtance of the general axiom; that 'whatever is true univerſally of any *ſign*, (or, 'as I would ſay, *genus*) muſt alſo be true of 'every individual which that ſign can be em'ployed to expreſs.' As long, therefore, as the major propoſition contains the genus, of which the minor denotes a ſpecies, or individual, our aſſent will doubtleſs be given to the concluſion. But if this be not the caſe, our aſſent will neceſſarily be withheld; on which account, I think Mr Stewart has not given a well-ſelected example of ſubſtitution in the ſyllogiſm, whoſe minor is, *z is an x;* which will never enforce our aſſent, unleſs we ſettle, by previous definition, that *x* denotes a genus, or ſpecies, of which *z* is an individual. All which, I think, reſults properly from the neceſſity of underſtanding the meaning of the terms of a ſyllogiſm, and indeed of every proceſs of reaſoning, before we admit the concluſion.

The laſt obſervation I have to make on Mr Stewart's illuſtrations of the Nominal ſyſtem, is upon his remark relative to abſtract terms, (in c. 4. ſect. 1. of the Elem. of the Phil. &c.) *viz.* 'that it frequently happens that we can 'reaſon concerning one quality or property of 'an object abſtracted from the reſt, while, at 'the ſame time, we find it impoſſible to conceive it ſeparately. Thus, I can reaſon concerning extenſion and figure, without any 'reference to colour; although it may be 'doubted, if a perſon poſſeſſed of ſight can 'make extenſion and figure ſteady objects of 'conception, without connecting with them 'one colour or another. Nor is this always 'owing (as it is in the inſtance now mentioned) merely to the aſſociation of ideas; for 'there are caſes in which we can reaſon concerning things ſeparately, which it is impoſſible for us to ſuppoſe any being ſo conſtituted as to conceive apart. Thus, we can 'reaſon concerning length, abſtracted from 'any other dimenſion; although, ſurely, no 'underſtanding can make length, without 'breadth, an object of conception.'

It would ſeem as if philoſophers had, in many caſes, ſuppoſed it to be impoſſible that we can form any conception relative to ſenſible objects, which we ſhould be unable to picture, as it were, before the eyes; or rather, abſolutely to delineate upon canvas. Every object which we ſo delineate muſt, doubtleſs, have ſome colour, at leaſt if we take that term in its vulgar acceptation; but it is by no means a conſequence of this, that colour muſt form a part of the *mere mental conception* of magnitude. Indeed, Mr Stewart acknowledges that, when it does, it is merely the conſequence of aſſociation; and that it cannot at all hold in the caſe of the blind. A ſimilar ſolution may be given of the difficulty with regard to the aſſociated ideas of length and breadth. Although every delineated line, however fine, muſt have breadth as well as length, yet, in the mere *mental conception* of length, breadth may be entirely kept out of view; and certainly is, in many of our geometrical ſpeculations. Nay, I am inclined to go a little farther, and to expreſs a doubt whether extenſion without colour, and length without breadth, are not only objects of diſtinct conception, but even, occaſionally, objects of ſight. Thus, when I look around me in an empty apartment, I have a clear perception of its ſolid capacity or extent; yet this capacity or extent is without colour; for, though the walls of the apartment may be of one colour, the roof of another, and the floor of a third; none of theſe is the colour of that maſs of air, which is accurately defined by the limits of the chamber, and which cannot be ſaid to have any colour at all. Again, I would aſk, when we contemplate the direct diſtance between any two given points, what is the object of our perception, in this caſe, but length without breadth?

It is not, however, neceſſary to give a decided opinion upon theſe particulars, in order to admit the force of the preceding reaſoning, of which the object is, to eſtabliſh that we are capable of annexing a diſtinct conception, or meaning, both to abſtract and general terms; but, with this difference, that the object of our thoughts, when we employ the former, is one individual quality or attribute; and, when we employ the latter, an indefinite collection, or claſs, of individual objects: a diſtinction which, I apprehend, has by no means been ſufficiently attended to by thoſe who have treated of this ſubject.

I do not, however, mean to aſſert, that we are capable of forming a diſtinct conception of the meaning of every abſtract term which uſage authoriſes, or which may be found in the writings of the moſt approved authors. Many abſtract, as well as many general terms, have come into uſe without a ſtrict examination of their preciſe import; which, in fact, it may be by no means eaſy to aſcertain. Many, too, owe their origin to philoſophical ſyſtems, and do not admit of having any diſtinct notion annexed to them. * 'Becauſe,' ſays the Abbé de Condillac, (*La Logique*, part. 1. c. 5.) 'we give names to things of which 'we have ideas, it is ſuppoſed that we have 'ideas of every thing to which we aſſign a 'name. This, however, is a great error; for 'many things are named, of which we have 'no diſtinct notion.'—'The logician,' ſays he again, (Sur l'Orig. des Con. Hum. part. 1. § 5.) 'having laid it down, that the eſſence of 'a thing is that which makes it to be what it 'is, thought, that to form ideas of theſe eſſences, nothing more was neceſſary than to give 'them names. Thus they formed the words '*corporiety*, *animality*, *humanity*, to denote the

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* 'Parce que nous donnons des noms à des choſes 'dont nous avons une idée, on ſuppoſe que nous avons 'une idée de toutes celles auxquelles nous donnons des 'noms. Voilà une erreur dont il faut ſe garantir. Il 'ſe peut qu'un nom ne ſoit donné à une choſe que parce 'que nous ſommes aſſurés de ſon exiſtence.'

'eſſences of body (*corpus*) of animal, and of 'man (*homo.*)' 'To this ſource,' adds he again, 'we owe the genera, ſpecies, eſſences, 'and differences, which are repreſented as 'exiſting in each ſubſtance, and cauſing it to 'be what it is; and which theſe learned men 'would have us to believe are not mere 'words, but real beings, hidden from all the 'reſt of the world*.

In reſpect to ſuch terms as theſe, I have no ſcruple in admitting the ſyſtem of nominaliſm; for I believe they are words to which no diſtinct meaning or conception belongs. But, on this very account, I conſider them as words which will never enable us to make real advances in ſcientific inveſtigations, but which are rather calculated to retard our progreſs in true knowledge. They are the remnant of the jargon of the ſchoolmen, who were wont to conceal their ignorance of things under the veil of learned and high-ſounding phraſes, which they themſelves neither did or could underſtand; and which, therefore, ought to be diſcarded from the language, not only of ſcience, but even of common life. Moſt of theſe terms are derived from the learned languages, where they may have originally had an intelligible ſignification, very different from that which philoſophical uſage afterwards confers upon them; a circumſtance, which ſerves

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* 'Or, l'eſſence d'une choſe étant, ſelon les philo'ſophes, ce qui la conſtitue ce qu'elle eſt.—C'eſt peut'être là une des raiſons qui a fait croire aux ſcolaſtiques 'que pour avoir des noms qui exprimaſſent les eſſences 'des ſubſtances, ils n'avoient qu'à ſuivre l'analogie du 'langage. Ainſi, ils ont fait les mots de *corporiété*, 'd'*animalité*, et d'*humanité*, pour déſigner les eſſences du 'corps,

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‘ *corps*, de l'*animal*, et de l'*homme*. C'eſt à elles que nous devons *ces genres*, *ces eſpeces*, *ces eſſences*, et *ces différences*, qui ſont tout autant d'êtres qui vont ſe placer dans chaque ſubſtance, pour la déterminer à être ce qu'elle eſt. . . . . . tous dévoilent aux yeux des philoſophes des êtres cachés au reſte des hommes.’

to render their want of meaning leſs perceptible. Thus, the philoſophic import of *substantia*, is very different from its natural meaning, *viz.* ‘ that which is beneath ; ’ and that of *essentia* or *essence*, from its original import, *viz.* a mere *being* or *existence.* We are told, that this laſt word was firſt of all employed by Cicero, whom we ſhould little have ſuſpected of having rendered ſo great a ſervice to the ſchoolmen. It is an ingenious remark of M. de Condillac (*La Logique*), ‘ that the beſt ‘ language for philoſophical purpoſes, would ‘ be one which ſhould borrow nothing from ‘ any other ; becauſe the analogy of ſuch a ‘ language would exhibit the progreſſive advances of knowledge, and would be, itſelf, ‘ a commentary upon ſcience. ’ *

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* ‘ Une langue ſerait bien ſupérieure, ſi le peuple qui ‘ la fait, cultivait les arts et les ſciences, ſans rien emprunter d'aucun autre ; car l'analogie, dans cette langue, ‘ montrerait ſenſiblement le progrès des connoiſſances, et ‘ l'on n'aurait pas beſoin d'en chercher l'hiſtoire ailleurs.’ *La Logique*, 2de partie, c. 4.

But, even in caſes in which words admit of having their meaning defined with preciſion, men are but too apt to employ them vaguely, and without ſufficient conſideration. 'When,' ſays M. de Condillac, (Sur l'Orig. des Con. Hum. Part. 1. § 4. c. 1.) 'we reflect how 'much more the memory is ſtored with 'words, than the underſtanding with ideas, 'we ſhall not be ſurpriſed at the inaccuracy 'of many of our notions and expreſſions. 'This muſt neceſſarily follow, from the great 'interval which elapſes between the time 'when the memory of a child is ſtored with 'words, and that in which its judgment comes 'to be exerciſed in ſettling their meaning. 'And what a labour is it to accompliſh this, 'with every ambiguous expreſſion? a labour 'which the greateſt part of mankind never 'think of attempting, it being ſufficient, for 'their purpoſe, to take words as they find them, 'and uſe them in ſomething like their proper 'ſenſe. The conſequence is, that thoſe who 'examine their own thoughts will find, that they employ a great number of words to which they annex very imperfect ideas, and ſome, to which they attach no ideas at all.' *

The

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* 'Cette vérité fera connoître à tous ceux qui voudront réfléchir ſur eux-mêmes, combien le nombre des mots que nous avons dans la mémoire, eſt ſuperieur à celui de nos idées. Cela devoit être naturellement ainſi; ſoit parceque la reflexion ne venant qu'après la mémoire, elle n'a pas toujours repaſſé avec aſſez de ſoin ſur les idées auxquelles on avoit donné des ſignes, ſoit parceque nous voyons qu'il y a un grand intervalle entre le tems où l'on commence à cultiver la mémoire d'un enfant, en y gravant bien des mots dont il ne peut encore remarquer les idées, et celui où il commence à être capable d'analyſer ſes notions, pour s'en rendre quelque compte. Quel travail ne ſeroit ce pas s'il falloit qu'elle en examinât tous les ſignes? Combien d'hommes chez qui elle n'a jamais lieu! On les emploie donc tels qu'ils ſe preſentent, et l'on ſe contente ordinairement d'en ſaiſir à peu-près le ſens. Je le répete donc; tous ceux qui rentreront en eux-mêmes, y trouveront grand nombre de ſignes auxquels ils n'ont lié

'que

The above obſervations appear to me fully ſufficient to explain the common cauſes of ambiguity

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'que des idées fort imparfaites, et pluſieurs mêmes auxquels ils n'en attachent point du tout.'

A ſimilar remark occurs in Mr Locke's Eſſay (B. III. c. 10. § 4.) 'Men,' ſays he, 'having been accuſtomed 'from their cradles to learn words, which are eaſily got 'and retained, before they knew, or had framed the complex ideas to which they were annexed, or which were 'to be found in the things they were thought to ſtand for, 'they uſually continue to do ſo all their lives; and, without taking the pains neceſſary to ſettle in their minds 'determined ideas, they uſe their words for ſuch unſteady and confuſed notions as they have, contenting 'themſelves with the ſame words other people uſe; as if 'their very ſound neceſſarily carried with it inſtantly the 'ſame meaning. This, though men make a ſhift with, 'in the ordinary occurrences of life, where they find it 'neceſſary to be underſtood, and, therefore, they make 'ſigns till they are ſo; yet this inſignificancy in their 'words, when they come to reaſon, concerning either 'their tenets or intereſt, manifeſtly fills their diſcourſe 'with abundance of empty, unintelligible noiſe and jargon, ambiguity in language, without having recourſe to the ſyſtem of Nominaliſm. They will alſo explain the circumſtance ſo ingeniouſly illuſtrated by Dr Campbell, (Phil. of Rhet. B. II. c. 7.) *viz.* 'how it happens' (as he expreſſes it) 'that nonſenſe ſo often eſcapes 'being detected, both by the writer and the 'reader.' The caſes in which, according to him, this moſt frequently occurs are, 1*ſt*, Where there is an exuberance of metaphor; 2*dly*, When the terms moſt frequently occurring, denote things which are of a complicated nature, and to which the mind is not ſufficiently familiarized; and, 3*dly*, When the terms employed are very abſtract, and, conſequently, of very extenſive ſignification. In all theſe

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'gon, eſpecially in moral matters, where the words, for 'the moſt part, ſtanding for arbitrary and numerous col'lections of ideas, not regularly and permanently united 'in nature, their bare ſounds are often only thought on, 'or, at leaſt, very obſcure and uncertain notions annexed 'to them.'

theſe caſes, the cauſes of miſtake plainly ariſe, either from employing terms which have in fact no meaning at all, or which we have been accuſtomed to uſe, without ſufficiently attending to their ſignification.

Mr Burke (in his Treatiſe on the Sublime and Beautiful) has ſupported the Nominal doctrine upon ſimilar grounds. ‘ If, ’ ſays he, ‘ words have all their poſſible extent of power, ‘ three effects ariſe in the mind of the hearer. ‘ The firſt is, the *sound*; the ſecond, the *picture*, or repreſentation of the thing ſignified ‘ by the ſound; the third is, the *affection* of ‘ the ſoul, produced by one or both of the ‘ foregoing. Compounded, abſtract words, ‘ (honour, juſtice, liberty, and the like,) produce the firſt and laſt of theſe effects, but ‘ not the ſecond. ’ He ſeems even inclined to carry the Nominal ſyſtem farther than any of his predeceſſors; for he is of opinion, ‘ that ‘ the moſt general effect of theſe words (which 'are capable of effecting all three of the pur'poſes of words), does not ariſe from their 'forming pictures of the ſeveral things they 'would repreſent in the imagination; be'cauſe,' ſays he, 'on a very diligent exami'nation of my own mind, and getting others 'to conſider their's, I do not find that, once in 'twenty times, any ſuch picture is formed; 'and, when it is, there is moſt commonly a 'particular effort of the imagination for that 'purpoſe.' 'Indeed,' adds he afterwards, 'it is impoſſible, in the rapidity and quick 'ſucceſſion of words in converſation, to have 'ideas both of the ſound of the word, and the 'thing repreſented. Beſides, ſome words ex'preſſing real eſſences, are ſo mixed with 'others of a general and nominal import, that 'it is impracticable to jump from ſenſe to 'thought, from particulars to generals, from 'things to words, in ſuch a manner as to an'ſwer the purpoſes of life; nor is it neceſſary 'that we ſhould.' This ingenious writer appears, from his concluſive remark, to have formed a very inadequate notion of the rapidity of human thought; a ſubject which I have had occaſion partly to illuſtrate in the chapter upon Conſciouſneſs, and which appears to me perfectly to explain how Mr Burke was unable to aſcertain, in the caſe of his own mind, that 'once in twenty times any ſuch picture 'is formed.' In fact, nothing appears to be more evaneſcent than the thoughts or conceptions which, on ſome occaſions, paſs through our minds; and it furniſhes abundance of employment for the philoſopher, to detect and bring to light thoſe rapid trains of thinking by which our judgements are ſometimes regulated, as it were, unknown to ourſelves. All this, however, corroborates the doctrine, that conceptions muſt be raiſed in the mind, and are actually raiſed, by the appropriate terms of language, on every occaſion where we can be ſaid to *underſtand the meaning* intended to be conveyed.

The practical inference that I would deduce from this inveſtigation of the nature and import of the various terms of language, is, that it ſhould be our ſedulous endeavour, preciſely to fix the meaning of every term which we have occaſion to employ during our inveſtigations; and if the term is liable to any ambiguity, either from its own nature, or on account of a laxity of uſage, we ought accurately to define or deſcribe the preciſe ſenſe in which we mean to employ it. As for thoſe terms which we have repreſented as devoid of any real intelligible ſignification, I think ſcientific inveſtigation would be greatly promoted, by diſcarding them altogether; and the attempt accurately to define their meaning, will form a very convenient teſt, by which ſuch uſeleſs incumbrances of language may be diſcovered.*

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* 'Une idée fauſſe,' ſays *Helvetius*, 'exige une 'expreſſion obſcure. L'erreur, clairement expoſée, eſt

It is for want of attending to ſome ſuch rules as theſe, that many philoſophical ſpeculations have tended rather to darken and perplex, than to enlighten the mind; and that others, inſtead of ſolid information, have contained nothing but empty quibbles, and frivolous verbal

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'bientôt reconnue pour erreur. Oſer exprimer nettement ſes idées, c'eſt être sûr de leur verité. En aucun genre les charlatans n'ecrivent clairement. Point de ſcholaſtique qui puiſſe dire comme Boileau,

"Ma penséе au grand jour toujours s'offre et s'expose."

De l'Homme, ſect. 8. *ch.* 17.

'Verba autem plerumque,' (ſays *Bacon*) 'ex captu vulgi induntur, atque per lineas vulgari intellectui maxime conſpicuas res ſecant. Quum autem intellectus acutior, aut obſervatio diligentior eas lineas transferre velit, ut illæ ſint magis ſecundum naturam, verba obſtrepunt. Unde fit ut magnæ et ſolennes diſputationes hominum doctorum ſæpe in controverſias circa verba et nomina deſinant; a quibus ex more et prudentia mathematicorum, incipere conſultius foret, eaſque per definitiones in ordinem redigere.'

Novum Organum, 59. 1.

bal diſputation. Hence the juſt complaint of Mr Locke concerning the abuſes of language, when he ſays (B. 3. c. 11. § 4.), that he 'who 'ſhall well conſider the errors and obſcurity, 'the miſtakes and confuſion, that are ſpread 'in the world by an ill uſe of words, will find 'ſome reaſon to doubt whether language, as 'it has been employed, has contributed more 'to the improvement or hinderance of know'ledge in the world.' This judicious philoſopher has dedicated a whole book of his Eſſay (B. 3.) to the examination of the imperfections of language, and their remedies. The attentive ſtudy of the whole book, and more particularly of chapters 10th and 11th, which treat more expreſsly of the abuſe of words and its remedies, cannot be too ſtrongly recommended.

CHAPTER FIFTH.

Of Aſſociation, or Combination.

SECTION I.

General Remarks upon this Faculty.

It is matter of the moſt familiar obſervation, that we are apt to connect together the various objects of our thoughts according to ſome real or ſuppoſed relations which we obſerve among them; ſo that they come afterwards to be ſuggeſted to the mind, the one by the other. This principle of the human conſtitution has received a conſiderable degree of attention from late philoſophers; and, in particular, it has been very ſucceſsfully illuſtrated by Mr Stewart. It has uſually been denominated the *Aſsociation of Ideas*; a term which is exceptionable, both on account of its redundancy, and of its alluſion to the viſionary Ideal theory. The faculty will be ſufficiently diſcriminated by the term *Aſsociation* alone; or by a name which, I think, ſtill more preciſely and unexceptionably expreſſes its nature, viz. *Combination.*

The faculty of Combination is the direct counterpart of Abſtraction. By the latter, we analyze the individual objects with which nature preſents us; ſo as to make their various qualities and attributes ſeparate ſubjects of our thoughts. By the former, we form theſe objects into various claſſes, or groups, according to ſome obſerved reſemblance among them; or we connect together certain individuals, which have no real relation to one another, merely on account of ſome accidental circumſtance which has occaſioned them to be preſent to our thoughts at the ſame moment. Both faculties are eminently ſubſervient to the advancement of our knowledge, and the progreſs of ſcientific inveſtigation; the object of which is, to aſcertain thoſe general laws, or firſt principles, according to which the phenomena of whole claſſes of beings are regulated.

Philoſophers appear, in general, to have ſpoken of the faculty of Aſſociation, as if it were altogether involuntary, and placed beyond our own controul. They repreſent the connexion which comes to be eſtabliſhed between the objects of our thoughts, as taking place, as it were, entirely of itſelf; ſo that the one ſpontaneouſly ſuggeſts the other, upon all occaſions. In fact, however, the power of Aſſociation ſeems, on many occaſions, to demand an active effort; although, like all the other powers of the underſtanding, it frequently operates without any great energy of volition.

tion. Thus, when we form claſſes of objects, in conſequence of an obſerved reſemblance among them, the active effort of the mind, in tracing the reſemblance, is ſufficiently apparent: and the man of wit muſt frequently be conſcious of a ſufficiently active effort in tracing out thoſe remote alluſions and analogies which form the charm of the effuſions of his fancy.

The importance of the principle of Aſſociation in the human conſtitution, is ſo great, that it would be very deſirable to have an accurate analyſis of the laws by which it is regulated; or of thoſe particular circumſtances by which we are induced to form combinations among the objects of our thoughts. But though various enumerations of theſe circumſtances have been offered by philoſophers, it does not appear that this object has yet been ſucceſsfully accompliſhed.

Ariſtotle, in his treatiſe *de Memoriâ et Reminiſcentia*, remarks, that the relations by which we are led from one thought to another, in tracing out any particular thought which does not immediately occur, are chiefly three, Reſemblance, Contrariety, and Contiguity; and this may be conſidered as the earlieſt attempt at an enumeration of the principles of Aſſociation among our thoughts. Mr Hume appears to have been the firſt among modern philoſophers, who endeavoured particularly to ſupply this deſideratum. His enumeration of the principles of Aſſociation, as is well known, conſiſts likewiſe of three diviſions, *viz.* Reſemblance, Contiguity in time and place, and Cauſe and Effect. Subſequent philoſophers have not done much to increaſe the liſt; as the enumerations of Dr Beattie, Dr Gerard, &c. are little more than a combination of thoſe of Ariſtotle and Mr Hume.

Mr Stewart (Elem. of the Phil. of the Hum.

Mi d, c. 5. part 1. § 2.) expreſſes his opinion that this problem does not admit of a ſatisfactory ſolution; ‘ for,’ ſays he, ‘ there is no ‘ poſſible relation, among the objects of our ‘ knowledge, which may not ſerve to connect ‘ them together in the mind; and therefore, ‘ although one enumeration may be more ‘ comprehenſive than another, a perfectly ‘ complete enumeration is ſcarcely to be expected.’ He appears however, afterwards, to have mentioned all the moſt remarkable of the principles of aſſociation, when he takes occaſion to notice a diſtinction among them which he thinks of importance. ‘ The relations,’ ſays he, ‘ upon which ſome of ‘ them are founded, are perfectly obvious to ‘ the mind. Thoſe which are the foundation ‘ of others, are diſcovered only in conſequence of particular efforts of attention. ‘ Of the former kind, are the relations of Reſemblance and Analogy, of Contrariety, of ‘ Vicinity in time and place, and thoſe which 'ariſe from accidental coincidences in the ſound 'of different words. Theſe, in general, connect 'our thoughts together, when they are ſuffered 'to take their natural courſe, and when we are 'conſcious of little or no active exertion. Of 'the latter kind, are the relations of Cauſe and 'Effect, of Means and End, of Premiſes and 'Concluſion; and thoſe others, which regulate 'the train of thought in the mind of the philo'ſopher, when he is engaged in a particular in'veſtigation.'

There is another diſtinction which may be pointed out between the various claſſes of aſſociating principles, and which, in my apprehenſion, is of yet more importance than that mentioned by Mr Stewart in the above paſſage. According to this diſtinction, the relations in conſequence of which Aſſociation takes place, are either *eſſential*, or *accidental*. Among the eſſential relations, the moſt remarkable appear to be, 1. Reſemblance; 2. Analogy; 3. Contrariety; 4. Mutual Dependence,

pendence, as of cauſe and effect, premiſes and concluſion, means and end, &c. The accidental relations, or ſources of Aſſociation, ſeem chiefly reducible to the circumſtance of the two objects of thought having been preſented to the mind together; or, from what Mr Hume has called contiguity in time and place, in conſequence of which we are led afterwards to think of them at the ſame time, and to conceive ſome real connexion between them. It will not be an uſeleſs employment to offer a few illuſtrations of each of theſe ſources of combination.

1. That reſemblance is a natural ſpecies of relation, and leads us to connect together the objects of our thoughts, is matter of the moſt familiar obſervation. It is our proneneſs to trace out this kind of relation, that leads us to give generic names to certain claſſes of objects; ſuch as animals, trees, ſtones, &c.; as has been illuſtrated in the preceding chapter: and ſo powerfully are we prompted to this exercife

erciſe of our faculties, that we are in much greater danger of ſuppoſing reſemblances between objects which are eſſentially different, than of not diſcovering a reſemblance where it really exiſts. The gratification, however, which nature has attached to the exerciſe of this act of the mind, is of the greateſt advantage in promoting our knowledge; for, by continually ſeeking to diſcover new points of likeneſs in the objects of nature, we are led to reduce them to a few ſimple claſſes, and to diſcover the general laws by which their phenomena are regulated.

Many of the pleaſures of taſte may be aſcribed to the gratification accompanying the diſcovery of reſemblance. The merit of wit appears to be juſtly placed in tracing remote and unexpected reſemblances among the objects of our thoughts, which, from their novelty and ſingularity, are calculated to excite admiration. The pleaſing effect of ſimile, poetical alluſion, metaphor, and allegory, alſo ariſes, in a great meaſure, from the ſame cauſe; although, very generally, in all theſe caſes, the principle of relation, or aſſociation, is rather reducible to analogy than to reſemblance; as there is more room for ingenuity and the exerciſe of fancy, in tracing a ſimilarity of effects, or general conſequences, which conſtitutes an analogy, than in diſcovering a mere likeneſs, or preciſe identity.

Reſemblance of ſound is one pretty copious ſource of this kind of gratification. Of this we have ſufficient proof, in the ſtructure of modern verſe, which, in moſt of the languages of Europe, has not only the accompaniment of rhythm, or a meaſured number of long and ſhort, or emphatic and unemphatic ſyllables; but likewiſe that of rhyme, or a recurrence of reſembling ſounds at the termination of its lines. This accompaniment of verſe was rejected by the poets of Greece and Rome;

Rome, which ſeems to have ariſen from its being conſidered as of no value, on account of the great facility with which it might have been accompliſhed in the ancient languages; and, in fact, the examples which we have of its effect in the monkiſh poetry of the dark ages, are not calculated to give us a high idea of its beauty. But rhyme appears to have been adopted in the poetical compoſitions of our Gothic forefathers; and is likewiſe found in the poetry of various Eaſtern nations, as well as of the Indian tribes; ſo that it is a ſource of gratification evidently founded in the natural conſtitution of man.

The pun, or *paronomasia*, which has been ſo generally decried, and yet ſo univerſally practiſed, conſiſts in nothing more than employing a word which is ambiguous either in ſenſe or ſound, and of which both the meanings are ſuggeſted at once by the way in which it is uſed: It gratifies, therefore, as an example of a newly diſcovered reſemblance. The gratification, if there be any, which *alliteration* produces, is to be aſcribed to the ſame ſource; of which the admirers have a rich treat, in the ' Pugna Porcorum, per Publium Porcium ' poetam. '

2. Analogy is a copious ſource of combination among our thoughts. It may be defined, a ſimilarity, or correſpondence, not of the objects of thought themſelves, but of their general effects or conſequences. Thus, the ſpring of the year, or the morning of the day, ſuggeſts to our thoughts the period of infancy, or youth; as winter, or evening, is naturally aſſociated with the idea of old age. The mind is, indeed, extremely prone to trace out ſuch analogies, which are, in fact, after all, but reſemblances of a particular kind; and, in many caſes, it may fancy them to exiſt without any real foundation; of which we have the moſt remarkable example in the ſo generally con-

ceived analogy between the properties of body, and thoſe of mind; the erroneouſneſs of which we have already had occaſion to remark.

I have already hinted, that the relations obſervable in the effuſions of wit, in poetical alluſion, ſimile, metaphor, and allegory, belong rather to the combinations of analogy, than to thoſe of reſemblance; and there is certainly much more ingenuity in tracing the former than the latter. Thus, the well known ſimilitude of Butler,

> And now like lobſter boil'd the morn,
> From black to red began to turn.

exhibits an analogy certainly very remote from common apprehenſion. The witty Swift can, in like manner, trace an analogy between wiſdom and a cheeſe, a ſack-poſſet, a hen, and a nut, &c. (See Introd. to the Tale of a Tub.) It is an analogy of a ſtriking and intereſting kind, that was traced by Cicero, and, after him, by Mr Locke, between the mind and the eye, which ſees every object around it, but is inviſible to itſelf.

The diſcovery of ſuch analogies has the double merit of embelliſhing and illuſtrating a ſubject; and they are therefore, with propriety, introduced, not only into the amuſing kinds of compoſition, but alſo into thoſe of the grave and didactic form. The following are happy inſtances of the effects of ſuch well choſen analogies, though not in works profeſſedly didactic. 'To endeavour' (ſays Pope, in his Thoughts on Various Subjects) 'to 'work upon the vulgar with fine ſenſe, is 'like attempting to cut blocks with a razor.' 'Did you ever' (ſays Swift in one of his Letters to Lord Bolingbroke) 'obſerve one of 'your clerks cutting his paper with a blunt 'ivory knife? Did you ever know the knife 'fail to go the right way? Whereas, if you 'had uſed a razor, or a penknife, you had 'odds againſt you of ſpoiling a whole ſheet.'

This alluſion is happily employed by the Dean, to illuſtrate the diverſity between genius, and ordinary uſeful abilities. An analogy of the moſt remote kind, conſiſting merely in the general effect produced upon the mind, is expreſſed in the following beautiful ſimilitude of Oſſian. 'The muſic of Carryl was like the 'memory of joys that are paſt; pleaſant and 'mournful to the ſoul.'

3. Contrariety or Contraſt, is likewiſe a common ſource of combination among our ideas. The darkneſs of night will frequently induce us to think of the ſplendour of day; and exceſſive cold naturally turns our thoughts to the comforts of heat. It was contrariety that aſſociated in the mind of Xerxes, the melancholy idea of mortality and diſſolution, with the proſpect of his millions in the pride of activity and military ſplendour; when he lamented, that in a ſhort period of time, not one of them would be found upon the earth. This bias of the mind is

likewiſe eminently conducive to the advancement of our knowledge; for it leads us to inquire in what reſpects the various objects of nature differ from one another, as well as wherein they agree; and, thus, ſtimulates us to acquire an accurate knowledge of their properties.

The relation of contrariety enters pretty largely into the alluſions of wit, in conjunction with thoſe of reſemblance, or analogy; for, as already obſerved, the combinations of wit muſt not be obvious, or readily diſcoverable; that is, they muſt partake both of reſemblance or analogy, and of contrariety. That ſpecies of wit which conſtitutes the ludicrous, exhibits a due ſhare of this mixture of reſemblance and contraſt; for, according to the beſt analyſis we have of the eſſence of the ludicrous, it conſiſts in 'a mixture of relation and contrariety; or 'of incongruity in the parts of an object, or 'aſſemblage of related objects.' (See Dr Beattie's Eſſay on the Ludicrous in Compoſition,)

tion.) It may, however, be doubted whether this definition is not too comprehenſive, ſo as to include within it, not only the ludicrous, but all the alluſions and combinations of wit; which muſt poſſeſs, together with the relation of reſemblance, that alſo of contraſt. Thoſe combinations which are more ſtrictly ludicrous, doubtleſs, in general, exhibit ‘ the contraſt or oppoſition,’ as Mr Hutchiſon calls it, ‘ of dignity and meanneſs;’ which always has a direct tendency to excite laughter, and may juſtly be conſidered as the principal ſource of that emotion. Our burleſque compoſitions, mock-heroics, traveſties, &c. furniſh ample proofs of the truth of this poſition.

4. The fourth natural ſource of connexion among the objects of our thoughts, which we particulariſed, is Mutual Dependence. If we find one occurrence or phenomenon conſtantly ſucceeded by another, it is extremely natural that the one ſhould be ſuggeſted by the other to our

minds. On the ſame principle, the notion of the means employed, ſuggeſts the end which they are to accompliſh. Thus, when we obſerve the labours of the huſbandman, we naturally think of the harveſt which is to enſue; and the ſtudy of an argument or piece of reaſoning, induces the conſideration of the concluſion or conviction which it tends to produce. To this ſource of combination we, in a great meaſure, owe our deſire to diſcover the hidden cauſes of the phenomena of nature, or the eſtabliſhed dependence which theſe have one upon another.

It is the province of the philoſopher to aſcertain the real connexion between events, or what, in common language, we call their cauſes; and this taſk cannot be accompliſhed, but by a long and careful ſtudy of nature herſelf. The vulgar are, indeed, ſufficiently ready to aſſign cauſes for whatever they ſee; but their want of knowledge is a copious ſource of error in this field of ſpeculation. 'I remember, ſays Dr Reid, ‘ many years ago, a white ox ‘ was brought into the country, of ſo enor‘ mous a ſize, that people came many miles to ‘ ſee him. There happened, ſome months ‘ after, an uncommon fatality among women ‘ in child-bearing. Two ſuch uncommon ‘ events following one another, gave a ſuſpi‘ cion of their connexion; and occaſioned a ‘ common opinion among the country people, ‘ that the white ox was the cauſe of this fatal‘ ity.’ ‘ However ſilly and ridiculous this ‘ opinion was,’ adds our author, ‘ it ſprung ‘ from the ſame root in human nature, on ‘ which all natural philoſophy grows, namely, ‘ an eager deſire to find out connexions in ‘ things; and a natural, original, and unac‘ countable propenſity to believe, that the con‘ nexions which we have obſerved in time ‘ paſt, will continue in time to come.’ (Inquiry into the Human Mind.) The many ſuperſtitious obſervances which prevail among the vulgar, and, ſtill more, among ſavage nations, may be aſcribed entirely to this ignorance of the real dependence of events upon each other, and a proneneſs to admit a connexion where none really exiſts.

But, ſecondly, we not only connect the objects of our thoughts together, according to thoſe eſſential and natural relations which we obſerve among them, but alſo in conſequence of the mere accidental circumſtance of their having been preſented to the mind together. This fact is of ſo familiar obſervation, as ſcarcely to ſtand in need of illuſtration. 'In paſſing 'along a road, which we have formerly travelled in company with a friend,' (obſerves Mr Stewart, c. 5. part 1. § 1.) 'the particu-'lars of the converſation in which we were 'then engaged, are frequently ſuggeſted to us 'by the objects we meet with. In ſuch a 'ſcene, we recollect that a particular ſubject 'was ſtarted; and, in paſſing the different 'houſes, and plantations, and rivers, the argu-

'ments we were diſcuſſing when we laſt ſaw 'them, recur ſpontaneouſly to the memory.' 'That man,' ſays Dr Johnſon, 'is little to 'be envied, whoſe patriotiſm would not gain 'force upon the plain of Marathon, or whoſe 'piety would not grow warmer among the 'ruins of Iona.' (Journey to the Weſtern Iſlands, p. 347.)

This law of aſſociation is manifeſtly of the greateſt utility in promoting the exerciſe of memory; and, indeed, ſpontaneous or involuntary memory ſeems entirely to depend upon thoſe aſſociations which the mind has previouſly formed, whether according to natural or accidental relations. Of theſe, the accidental, or merely arbitrary combinations are, by no means, the leaſt extenſively uſeful to the memory, on account of their unlimited range; and what is called mechanical, or artificial memory, is entirely founded upon theſe combinations. It is in general a merely arbitrary relation that ſubſiſts between the ſign and the thing ſignified: as between the letters of the alphabet, and the ſounds of which they are expreſſive; as well as between theſe ſounds, or the various words of a language, and the thoughts which they are intended to denote. Thus, the whole fabric of language, whether written or oral, reſts upon that law of the human conſtitution, whereby things which are repeatedly preſented to the mind together, are afterwards ſuggeſted, the one by the other. The ſame may be ſaid of the ſigns and characters which the algebraiſt employs; the notes of the muſician; and various other like caſes.

Aſſociations which are merely arbitrary, appear to operate upon the mind with fully as much power as thoſe which are founded in nature. The well known effect of the national air, called 'Rans des Vaches,' upon the Swiſs regiments in foreign countries, in exciting what is called the '*maladie du pays*,' affords a ſtriking illuſtration of this fact. A ſimilar effect is ſaid to be produced upon our Highlanders, when at a diſtance from home, by the air of ‘ Lochaber no more. ’ The conſequences of theſe arbitrary aſſociations are ſometimes ſufficiently whimſical; of which Mr Locke records two remarkable inſtances. The firſt is, of a perſon ‘ perfectly cured of madneſs, by a very harſh and offenſive operation. The gentleman, who was thus recovered, with great ſenſe of gratitude and acknowledgment, owned the cure, all his life after, as the greateſt obligation he could have received; but, whatever gratitude and reaſon ſuggeſted to him, he could never bear the ſight of the operator. ’ The ſecond inſtance is ‘ of a young gentleman who having learnt to dance, and that to great perfection, there happened to ſtand an old trunk in the room where he learnt. The idea of this remarkable piece of houſehold ſtuff, had ſo mixed itſelf with the turns and ſteps of all his dan-

'ces, that, though in that chamber he could 'dance excellently well, yet it was only while 'that trunk was there; nor could he perform 'well in any other place, unleſs that, or ſome 'ſuch other trunk, had its due poſition in the 'room.' (B. II. c. 33. § 14. & 16.)

Indeed, there are few parts of the human conſtitution productive of more important effects, than the law which induces us to form arbitrary connexions among the objects of our thoughts; and few which demand more the cultivating care of the preceptor and guardian; a fact which ſeems to have excited due attention in ſome of our late treatiſes upon education. To this ſource are due many of the errors and prejudices of the human mind, not only in matters merely ſpeculative, but even in the judgements and deciſions of the moral faculty. The evident importance of this ſubject is therefore ſufficient to juſtify its ſeparate illuſtration, which will form the ſubject of the next Section.

SECTION II.

Of the Influence of Association on our various Judgments.

THE influence of arbitrary aſſociation, in giving a bias to our opinions and judgements, we ſhall conſider under three heads: 1*ſt*, As it affects the deciſions of taſte; 2*d*, As it affects our ſpeculative opinions; and, 3*d*, As it influences our moral judgements.

1. The influence of aſſociation, in regulating the deciſions of taſte, is indeed very powerful. To this ſource alone, is to be aſcribed the approbation which we beſtow upon the dreſs,

pronunciation, language, and manner of the great and the faſhionable. That it is no intrinſic excellence in the mode itſelf, which cauſes our approbation, is manifeſt from this, that, when it ceaſes to be the faſhion, we immediately ceaſe to approve it; and beſtow our admiration upon ſome other mode, which we before ſhould have condemned, but which comes now to be ſanctioned by the adoption of the great. The pronunciation, or language of the Court, may frequently be inferior, in real merit, to that of the provinces; but the latter is uniformly condemned, becauſe aſſociated with the ideas of coarſeneſs and vulgarity; while the former is uniformly applauded, on account of the contrary aſſociation. Thus, the cauſe of our approbation of whatever is called faſhionable, is to be ſought in the principle of aſſociation alone.

The effect of arbitrary aſſociation in matters of taſte, is ſtill more ſtrongly evinced in the permanent character which it frequently gives to the taſte of a nation. The Chineſe, for example, love a foot, in their women, ſo ſmall, as to be ſcarcely of any uſe in walking, becauſe with this they have aſſociated the notion of delicacy and elegance; while they deſpiſe a foot of the juſt proportions, becauſe, in their minds, it is aſſociated with mean and vulgar qualities. The ſame principle ſerves to explain why, in Holland, and, indeed, in moſt parts of the world, a ſtyle of gardening has prevailed, which the better taſte of this country condemns as ſtiff and unnatural. In thoſe countries, the efforts of artifice, ſkill, and labour, have become aſſociated with the notion of a garden; and the more viſible that the exertion of theſe is rendered, the more perfect is the work reckoned; and hence the profuſion of parterres, terraces, alleys, fountains, ſtatues, formal ſhrubs, and hedges, with which the Dutch gardens are loaded.

The influence of arbitrary aſſociation, is alſo manifeſted in the high value which we ſet upon the compoſitions with which we have been familiarized in early youth. Theſe are connected, in our minds, with a variety of pleaſing occurrences which have happened at that period; and, therefore, acquire a value, in our eſtimation, which they do not intrinſically poſſeſs. Thus, Mr Addiſon himſelf, though ſo acute a critic, under the bias of this natural prepoſſeſſion, could find every beauty of Homer or Virgil, in the ancient ballad of Chevy Chaſe, of which, undoubtedly, the principal merit is, a native and unadorned ſimplicity. (See Spectator, No. 70. & 74.)

It is upon a ſimilar principle that the compoſitions of celebrated authors come to be conſidered as perfect models of imitation; and their very defects are exalted into beauties, on account of their being ſo cloſely combined with thoſe parts of their works which are juſtly entitled to admiration. Few things have tended more to retard the progreſs of genuine taſte, than this ſuperſtitious veneration for great names. In this way the dictates of nature have been made to yield to authority; and the practice of an eminent writer has paſſed into a law never to be violated. Boſſu, a celebrated French critic, can find no better foundation for the numerous rules which he has given, than the practice of Homer or Virgil, ſupported by the authority of Ariſtotle. ‘ Strange,’ ſays Lord Kaimes, ‘ that in ſo ‘ long a work, the concordance, or diſcord- ‘ ance of theſe rules with human nature, ‘ ſhould never once have entered his thoughts.’ (Elem. of Criticiſm.)

Men, however, are now becoming more temperate in theſe matters, and can allow that there may be faulty paſſages even in ſuch works as the Iliad or Æneid. The cultivation of philoſophical criticiſm has tended to diſſipate the prejudices which are ſo apt to warp our deciſions in matters of taſte, and to correct the influence of arbitrary aſſociation. By the diffuſion of this ſcience, the ſtandard of true taſte comes gradually to be aſcertained; while it is rendered more and more manifeſt, that the deciſions of that faculty are not naturally guided by whim and prejudice, but have their foundation in the original conſtitution of man.

2. But, again, many of our ſpeculative opinions, and concluſions of reaſoning, are unduly influenced by caſual aſſociation. This influence is by no means confined to the vulgar and illiterate, in whom its operation is indeed peculiarly manifeſt; but has a powerful effect on many of the reaſonings of the philoſopher. A remarkable example of this we have had occaſion to illuſtrate at length in Chap. III., when treating of the theories concerning Perception. The Ideal theory, which has ſo long been implicitly admitted by philoſophers, it would

ſeem, owes its evidence to nothing elſe but the arbitrary aſſociation which exiſts in the minds of moſt men, between the notions of an effect, or motion produced, and that of an actual contact of the bodies, or ſubſtances, which produce the effect, the one upon the other. ‘ Nothing, ’ it was conceived, ‘ can act, or ‘ be acted upon, but when and where it is ‘ preſent. ’ And yet, as is obſerved in that chapter, when we come to examine the matter ſtrictly, we no more underſtand how bodies act upon one another, when in contact, than when at a diſtance; and there are not only many intellectual phenomena, but alſo many material phenomena, ſuch as thoſe of the various attractions, which appear to be produced by the mutual action of bodies at a diſtance from one another; ſo that this aſſociation, though ſo univerſally prevalent, is to be accounted a mere prejudice, or vulgar error.

The connexion conceived to ſubſiſt between the faculties of Senſation and Perception, affords another inſtance of the ſame kind, and, as ſuch, has been taken notice of by Mr Stewart, (Elem. &c. c. 5. part 2. § 1.) Theſe two faculties were uniformly confounded together by all metaphyſical writers previous to Dr Reid; from which circumſtance alone aroſe much erroneous ſpeculation. ‘ A clear ‘ conception of this diſtinction,’ ſays Mr Stewart, ‘ may be regarded as the key to all ‘ Dr Reid's reaſonings concerning the proceſs ‘ of nature in perception.’ Of this truth Dr Reid himſelf appears to have been ſufficiently aware; for he ſays, (Eſſay II. on the Intell. Powers, c. 16.) ‘ I ſhall conclude this ‘ chapter, by obſerving, that as the confounding our ſenſations with that perception of ‘ external objects which is conſtantly conjoined with them, has been the occaſion of moſt ‘ of the errors and falſe theories of philoſophers with regard to the ſenſes; ſo, the diſtinguiſhing theſe operations ſeems to me to

‘ be the key that leads to a right underſtand-
‘ ing of them.’

Mr Stewart has likewiſe taken notice of the influence of arbitrary aſſociation upon our ſpeculative concluſions, in the examples of the connexion which is eſtabliſhed in the mind between the notions of *colour* and *extenſion*; between thoſe of *ſpace* and *time*; and between the relations of *acuteneſs* and *gravity* in the muſical ſcale, and the notions of *ſuperiority* and *inferiority*, or *high* and *low*. (See as above.) Theſe, and other examples which might be mentioned, are ſufficient to eſtabliſh the neceſſity of guarding againſt the influence of caſual combination in our philoſophical ſpeculations; and more eſpecially in thoſe which are of the metaphyſical or abſtract kind.

3. In the laſt place, we have to contemplate the influence of arbitrary aſſociation, in a yet

more important point of view, *viz.* as it affects our moral judgments. There is a faſhion, it is well known, not only in matters of taſte and ſpeculative inquiry, but even in morality and religion. The man of ſpirit, as he is called, will but too often be aſhamed to own his reſpect for the ſacred truths of revelation, or his obedience to thoſe precepts of morality, which enjoin the practice of temperance, ſobriety, and the reſtraint of the paſſions. He has been accuſtomed to treat thoſe perſons who habitually practiſe ſuch duties, as of low and grovelling minds; and to conſider a deviation from them as a mark of ſuperior endowments, and of a mind emancipated from vulgar prejudices. Thus, it but too frequently happens, that men of rank and fortune become habitually vicious, from the mere influence of caſual aſſociation, and the falſe ſhame of avowing themſelves the friends of virtue.

Again, if we examine the moral and religious opinions which have prevailed in different ages of the world, and among the people of different climates and nations, we ſhall find a ſtriking diverſity in many important particulars. The ancient heathen and the modern ſavage enjoin us, while we do all the good we can to our friends, to be equally ſtudious to injure our enemies. The milder precepts of Chriſtianity, on the other hand, exhort to the complete forgiveneſs of injuries. Among the Romans, ſuicide was a virtue; among Chriſtians, it is a crime of the deepeſt dye. The South-Sea iſlanders, and the ancient Lacedemonians, practiſed theft without ſcruple; while, by the laws of Europe, it is puniſhed with death. So great, indeed, is the diverſity which prevails among the individuals of various climates and countries, in their opinions of right and wrong, that many philoſophers have been induced to conſider man as entirely the creature of education and habit, in what regards the ſentiments of morality. Of this opinion appears to have been even the candid Locke himſelf, (See Eſſay on the Hum. Und. book 1. c. 3.) But ſuch facts amount to nothing more than a proof of the extenſive influence of the principle of aſſociation, which, however it may bias, can never totally ſubvert the inherent power of the moral ſenſe. As is juſtly obſerved by Mr Stewart, (Elem., &c. c. 5. part 2. § 3.) 'there muſt be ſome limit, beyond which 'the theory of aſſociation cannot poſſibly be 'carried; for the explanation which it gives 'of the formation of new principles of action, 'proceeds on the ſuppoſition that there are o'ther principles previouſly exiſting in the 'mind.'

The heathen and the ſavage combine the ideas of valour and heroiſm with the revenge of injuries, and the deſtruction of their enemies; and hence deem ſuch conduct as praiſeworthy as gratitude for benefits received. But the more enlightened Chriſtian diſcerns true magnanimity in the forgiveneſs of injury; and juſtly deems it a greater act of heroiſm to return good for evil, than to ſatisfy the impulſe of his vengeance. A ſimilar explanation may be given of the diverſity of opinion between the Heathen and the Chriſtian, on the ſubject of ſuicide. While the one deems this a heroic act, the better inſtruction of the other leads him to conſider it rather as a proof of timidity; as well as a highly culpable renunciation of the controul of the Supreme Power.

With reſpect to the practice of theft, ſo prevalent among certain tribes, it may be remarked, that in thoſe countries where it has prevailed, property has been conſidered as of little or no value. In the South-Sea iſlands, the ſpontaneous bounty of nature renders hoarding altogether ſuperfluous; and, in ancient Sparta, the accumulation of property was poſitively prohibited. In this latter country, too, it was merely the diſplay of ſkill that ſanctioned the theft; for detection was ſure to cover the perpetrator with diſgrace.

Thus it appears, that the diverſities which are diſcovered in the moral ſentiments of mankind, ariſe from known laws of the human conſtitution. The baſis on which theſe moral ſentiments are founded is immutable; but they may be variouſly modified according to circumſtances peculiar to the individual. It is thus that the language of different tribes aſſumes a particular character and idiom, according to the peculiar circumſtances of their ſituation; but the fundamental principles of grammar continue radically the ſame in all dialects.

An important effect of the faculty of Combination, or Aſſociation, remains yet to be examined, *viz.* the power which it has in regulating the ſucceſſion of our ideas, and in directing the tranſition from one object of thought to another. This ſubject, however, we ſhall reſerve for the next Chapter, where a conſideration of the various objects on which the faculty of conception is exercifed, will naturally lead us to treat of the ſucceſſion or train of our thoughts.

CHAPTER SIXTH.

Of Conception and Imagination.

SECTION I.

General Remarks upon Conception.

‘ CONCEIVING, imagining, apprehending, ‘ underſtanding, having a notion of a thing,’ ſays Dr Reid, (Eſſay 4. on the Intel. Powers, c. 1.) ‘ are common words uſed to expreſs that ‘ operation of the underſtanding, which the ‘ logicians call *simple apprehension*. The having an idea of a thing is, in common language, uſed in the ſame ſenſe, chiefly, I ‘ think, ſince Mr Locke's time. Logicians,’ continues he, ‘ define ſimple apprehenſion to ‘ be the bare conception of a thing, without ‘ any judgment or belief about it. If this were ‘ intended for a ſtrictly logical definition, it ‘ might be a juſt objection to it, that conception and apprehenſion are only ſynonymous ‘ words; and that we may as well define conception by apprehenſion, as apprehenſion by ‘ conception. But it ought to be remembered, ‘ that the moſt ſimple operations of the mind ‘ cannot be logically defined. To have a diſtinct notion of them, we muſt attend to ‘ them as we feel them in our own minds. ’

The account which we have given of Conception, or Imagination, is, that it is the faculty by which we repreſent to our minds the objects of any of our other faculties, variouſly modified; which, though not a logical definition, perhaps conveys a more diſtinct notion of the nature of the power, than an enumeration of thoſe terms, which, though nearly ſynonymous

nonymous with Conception, are yet occaſionally uſed in very different ſenſes. Thus, when we reflect upon the nature of any particular intellectual faculty, as the memory, the judgment, &c. we exerciſe the faculty of Conception upon an object of Conſciouſneſs. If we reflect upon any agreeable or diſagreeable taſte, ſmell, feeling, &c. it is exerciſed upon an object of Senſation; if the object of our thoughts be any individual material body, conception is employed upon an object of Perception; if it be a ſingle quality, or attribute, it is an object of Abſtraction; and if it be a combination which does not exiſt in nature, it is an object of Aſſociation. I do not, however, aſſert that this enumeration includes all the objects upon which conception can be employed; but that all theſe may, occaſionally, be objects of this faculty.

Indeed, as is obſerved by Dr Reid (*ut ſupra*), Conception ſeems to form an ingredient in everyry operation of the mind. ‘ Our ſenſes,’ ſays he, ‘ cannot give us the belief of any object, ‘ without giving ſome conception of it at the ‘ ſame time. No man can either remember ‘ or reaſon about things of which he hath no ‘ conception. When we will to exert any of ‘ our active powers, there muſt be ſome con- ‘ ception of what we will to do; there can be ‘ no deſire nor averſion, love nor hatred, with- ‘ out ſome conception of the object: we can- ‘ not feel pain without conceiving it, though ‘ we can conceive it without feeling it. Theſe ‘ things are ſelf-evident. In every operation ‘ of the mind, therefore, in every thing we ‘ call thought, there muſt be conception. ‘ When we analyze the various operations ei- ‘ ther of the underſtanding, or of the will, we ‘ ſhall always find this at the bottom, like the ‘ *caput mortuum* of the Chemiſts, or the *mate-* ‘ *ria prima* of the Peripatetics; but, though ‘ there is no operation of the mind without ‘ conception, yet it may be found naked, de-

'tached from all others; and then it is called 'ſimple apprehenſion, or the bare conception 'of a thing.'

The objects of this faculty, when it is exercifed by itſelf, and unaſſociated with any other, are uſually denoted by ſingle words, or by two or more words which do not form a complete ſentence or propoſition; as, 'the 'river Thames,' 'a man,' 'a man of virtue.' For it is not the province of conception either to affirm or deny, or to expreſs any opinion or judgment; but merely to exhibit to the mind a notion of that object upon which it is exerciſed. Hence the terms *true* and *falſe* are improperly applied to our conceptions; they may be diſtinct or confuſed, ſtrong and lively, or weak and languid; but as they do not neceſſarily include any opinion, the cannot properly be ſaid to imply either truth or falſehood.

Mr Stewart (Elem. &c. c. 3.) has employed the term, Conception, in a much more limited acceptation than what we have above aſſigned to it. ‘ By conception,’ ſays he, ‘ I mean ‘ that power of the mind which enables it to ‘ form a notion of an abſent object of percep‘ tion, or of a ſenſation which it has formerly ‘ felt.’ ‘ I do not,’ adds he, ‘ contend that ‘ this is, excluſively, the proper meaning of ‘ the word; but I think that the faculty which ‘ I have now defined, deſerves to be diſtin‘ guiſhed by an appropriated name.’

If, indeed, the forming a notion of an abſent object of perception, or of a former ſenſation, be the ſole employment of a peculiar faculty of the mind, that faculty certainly deſerves an appropriated name. But if that faculty has likewiſe other functions, theſe, ſurely, ſhould be included in its deſcription, and in the enumeration of its objects; and this I take to be the caſe with the faculty of Conception.

ception. We form conceptions, as I apprehend, of objects of intellect, as well as of objects of ſenſe; of the objects of conſciouſneſs or abſtraction, as well as of thoſe of ſenſation and perception: and if theſe be only different employments or modifications of the ſame faculty, it ſurely tends to error, entirely to overlook a certain claſs of the objects of the faculty, and to limit its application to one denomination of them alone. As well might we limit the term, Memory, to the recollection of the events of the material world alone; or Abſtraction, to the analyzing of the objects of ſenſe, excluſive of thoſe of intellect.

The term, Imagination, is, as above ſtated, one of thoſe which is employed, in common language, to denote the faculty of which we are treating. Thus, it is no uncommon expreſſion, to ſay, 'I cannot imagine what 'you mean;' or, 'I imagined ſo and ſo to 'be the caſe;' where the word *imagine* has evidently the ſame ſignification with *conceive.* This term, however, is not unfrequently employed in a more limited ſenſe. ‘ Imagination,’ ſays Dr Reid (as above), ‘ when it is ‘ diſtinguiſhed from Conception, ſeems to me ‘ to ſignify one ſpecies of conception, to wit, ‘ the conception of viſible objects. Thus, in ‘ a mathematical propoſition, I imagine the ‘ figure, and I conceive the demonſtration: ‘ it would not, I think, be improper to ſay, ‘ I conceive both ; but it would not be ſo ‘ proper to ſay, I imagine the demonſtration.’ The etymology of the word appears to warrant its being employed in this ſenſe; but ſomething more ſeems to be included in its meaning, as uſually applied. Thus, when we ſpeak of the imagination of a poet, or an orator, ſomething more is certainly meant than a lively conception of objects of ſight.

Mr Stewart appears to have well defined the meaning of the word, in this its more appropriate ſenſe, when he aſſigns its province to be, ‘ to make a ſelection of qualities and of ‘ circumſtances, from a variety of different ob‘ jects, and, by combining and diſpoſing theſe, ‘ to form a new creation of its own. ’ (Elem. &c. c. 7. § 1.) I cannot, however, ſee the neceſſity of conſidering this as the province of a ſeparate and independent faculty of the mind, as is done by Mr Stewart; and the reaſon for this opinion may be deduced from what he has himſelf ſaid, in defining the functions of the imagination. ‘ From what has been ſaid, ‘ it is ſufficiently evident, that Imagination is ‘ not a ſimple power of the mind, like atten‘ tion, conception, or abſtraction; but that it ‘ is formed by a combination of various facul‘ ties. It includes conception, or ſimple ap‘ prehenſion, which enables us to form a ‘ notion of thoſe former objects of perception, ‘ or of knowledge, out of which we are to ‘ make a ſelection: Abſtraction, which ſepa‘ rates the ſelected materials from the qualities 'and circumſtances which are connected with 'them in nature; and Judgement, or Taſte, 'which ſelects the materials, and directs their 'combination.' (Elem. &c. c. 7. § 1.) Now, allowing that imagination does include all theſe things, this does not conſtitute it a ſeparate and peculiar faculty of the mind, but merely a complex mental operation: and this complexity is by no means peculiar to it; for few mental proceſſes can be reduced to the exerciſe of one ſimple faculty alone.

All the mental faculties, mentioned in the above enumeration of Mr Stewart, are included in the operation of the faculty of Combination or Aſſociation, already treated of; with this difference merely, that the ſubjects upon which it operates may be ſupplied, not only by conception, but alſo by perception, memory, or other ſources. It appears to me, therefore, more accurate, to conſider the faculty of Imagination as the ſame, either with the ready formation, or with the conception of new combinations of thought: and accordingly, it will be ſeen, by looking back to the 1ſt Sect. of the preceding Chapter, that many of thoſe efforts which are aſcribed to the man of lively imagination, ſuch as the effuſions of wit, ridicule, poetical alluſion, ſimile, and metaphor, are to be conſidered properly as exertions of the faculty of Aſſociation or Combination.

In few things do men differ more from one another, than in the extent and force of their powers of conception and imagination. It appears to be a juſt remark of Dr Reid, (*Eſſay* 4. on the Intellectual Powers, c. 1.) 'that indiſ-
'tinct conceptions of things are, for the moſt
'part, the cauſe, not only of obſcurity in writ-
'ing and ſpeaking, but of error in judging.'
From this he infers, 'that men are very much
'upon a level with regard to mere judgment,
'when we take that faculty apart from the
'apprehenſion or conception of the things
'about

'about which we judge; ſo that a ſound 'judgment ſeems to be the inſeparable com'panion of a clear and ſteady apprehenſion.' He quotes Deſcartes and Cicero in ſupport of this doctrine; the former of whom, in his Diſſertation on Method, ſays, 'Nothing is ſo 'equally diſtributed among men as judgment;' and the latter, in the 3d book De Oratore, makes this obſervation, 'It is wonderful, when 'the learned and unlearned differ ſo much in 'art, how little they differ in judgment.' The well known truth, that many philoſophical controverſies have been found to originate in nothing more than the miſapprehenſion or miſapplication of a term, affords a ſtrong confirmation of this doctrine; and ſhews the neceſſity of endeavouring to annex clear and preciſe conceptions to the terms which we employ, before we endeavour, by means of them, to advance our knowledge, or to communicate it to others.

That men differ from each other greatly, in the force of their imagination, or in the power of forming or conceiving new combinations, is matter of the moſt familiar remark. As far as the term, Genius, has yet been diſtinctly limited, it appears to denote a facility in forming ſuch combinations. This, in fact, is the proper province of invention, which is the peculiar prerogative of genius; for this can have no farther range than an analyſis, and new diſpoſition, of the various objects which nature preſents to us; and never can extend to a new creation of our own, in the ſtrict and proper acceptation of the word. Thus, a blind man, let his invention be ever ſo lively, could never diſcover a new property of light. *

According

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* 'Fancy,' ſays Dr Reid, 'may combine things 'that never were combined in reality. It may enlarge 'or diminiſh, multiply or divide, compound and faſhion 'the objects which nature preſents; but it cannot, by 'the utmoſt efforts of that creative power which we 'aſcribe

According to this view of the ſubject, a man of genius is no more than a man of active imagination;

'aſcribe to it, bring any one ſingle ingredient into its 'production, which nature has not framed, and brought 'to our knowledge by ſome other faculty.' 'This,' continues he, 'Mr Locke has expreſſed, as beautifully as 'juſtly. The dominion of man, in this little world of 'his own underſtanding, is much the ſame as in the 'great world of viſible things; wherein his power, how'ever managed by art or ſkill, reaches no farther than to 'compound and divide the materials that are made to his 'hand, but can do nothing towards making the leaſt par'ticle of matter, or deſtroying one atom that is already in 'being. The ſame inability will every one find in him'ſelf, to faſhion in his underſtanding any ſimple idea not 'received from the powers which God has given him.' (Eſſay IV. on the Intellectual Powers, c. 1.) The paſſage of Mr Locke, here alluded to, occurs in Book II. c. 1. § 2. of his Eſſay.

The ſame doctrine is diſtinctly ſtated by Dr Cudworth, in the following paſſage of his Intellectual Syſtem. 'For 'the mind cannot make any new cogitation, which was 'not before, but only compound that which is. As the

'painter

imagination; and though both terms are more uſually appropriated to literary eminence, yet if we take them in this ſenſe, the inventor in mechanics, in mathematics, agriculture, or any of the uſeful arts or purſuits of life, is as much entitled to the appellation of a man of genius and imagination, as the poet and the orator.

That kind of imagination which is limited to a ready conception of new combinations, when ſuggeſted to it, and does not extend to the original formation of ſuch combinations, may be called paſſive. This, though it does not go ſo far as to conſtitute a man of genius, yet it ſeems to furniſh the proper qualification for

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' painter cannot feign colours, but muſt uſe ſuch as exiſt ' in nature, only he can variouſly compound them together, and, by his pencil, draw the figures and lineaments of ſuch things as no where are; as he can add to ' the head and face of a man, the neck, ſhoulders, and ' body of a horſe.' p. 694.

for the man of taſte, ſince it enables him to reliſh and appreciate the productions of genius, although not to rival or excel them. Of the two qualifications, it may be doubted whether the latter does not moſt contribute to real enjoyment. The pleaſure which the man of fine taſte derives from contemplating the productions of genius, is ſcarcely inferior to the high reliſh which the exerciſe of invention itſelf imparts; and the inventive imagination of the man of genius, is but too apt to conjure up phantoms for his own torment; and to burn with jealouſies, which his fancy knows but too well how to feed. The hiſtory of Rouſſeau, of Chatterton, of Swift, Johnſon, and other geniuſes of heated, or of gloomy imaginations, affords ample confirmation of the truth of this remark.*

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* I would by no means be underſtood, here, to ſanction that indiſcriminate cenſure of genius, in which men of moderate abilities are ſometimes prone to indulge, and which

It is obſerved by Mr Stewart, (Elem. &c. c. 3.) that we are able to conceive the objects of

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which is ſo fairly ridiculed by Mr Hume, as already quoted at p. 109. It is noticed, in very ſimilar terms, in the following paſſage of Helvetius: 'Les gens médiocres ſe ſentant plus près du bon ſens que de l'eſprit, ils doivent faire peu de cas de celui-ci, le regarder comme un don futile; et de-là cette phraſe répetée par les gens médiocres: *Bon ſens vaut mieux qu'eſprit et que génie*; phraſe par laquelle chacun d'eux veut inſinuer qu'au fond il a plus d'eſprit qu'aucun de nos hommes célébres.' (*De l'Eſprit, Diſc.* 4. *Ch.* 12.) I allude, here, merely to the unfortunate eccentricities of genius, which will always be ſubjects of deep regret.

In the following paſſage of the ſame lively author, the term Imagination is defined and limited nearly as in the preſent work. 'L'imagination conſiſte dans une combinaiſon, un aſſemblage nouveau d'images, et un rapport de convenances apperçues entre ces images et le ſentiment qu'on veut exciter. Eſt-ce la terreur? l'imagination donne l'être aux Sphinx, aux Furies. Eſt-ce l'étonnement ou l'admiration? elle crée le Jardin des Heſpérides, l'Iſle enchantée d'Armide, et le Palais d'Atlant. L'imagination eſt donc l'invention en fait d'images, comme l'eſprit l'eſt en fait d'idées.' (*Diſc.* 4. *Ch.* 2.

of ſome of the ſenſes, much more eaſily than thoſe of others. Thus, we can conceive an abſent viſible object, ſuch as a building, that is familiar to us, much more eaſily than a particular ſound, a particular taſte, or a particular pain, which we have formerly felt. The reaſon of this he appears to have juſtly aſſigned to be, 'that when we think of a ſound, or of a 'taſte, the object of our conception is one 'ſingle detached ſenſation; whereas every 'viſible object is complex; and the conception which we form of it as a whole, is 'aided by the aſſociation of ideas.' In confirmation of this may be ſtated, the facts which he mentions, of perſons acquiring the power of amuſing themſelves with reading written muſic; and that the harmony of verſe may be enjoyed without articulating the words, even in a whiſper. This ſhews that, though we can ſcarcely form a diſtinct conception of a ſingle ſound, yet a ſtrong conception may be formed of a ſeries of connected ſounds, where we are aided by the principle of aſſociation.

A very ſingular error on the ſubject of Conception, which appears to have pervaded the writings of the ableſt metaphyſical philoſophers, was firſt ſucceſsfully refuted by Dr Reid. It is, that our conception of things is a teſt of their poſſibility; ſo that what we can diſtinctly conceive, we may conclude to be poſſible; while of what is impoſſible we can have no conception. 'This opinion,' ſays Dr Reid, (Eſſay IV. on the Intellect. Powers, c. 3.) 'has been held by philoſophers for more 'than an hundred years, without contradic'tion or diſſent, as far as I know.'

In the philoſophy of Deſcartes, this maxim was carried ſtill farther; for there it was held, that whatever we clearly and diſtinctly conceive, is not only poſſible, but true. This maxim, however, was neceſſarily abandoned, when the philoſophy which inculcated it grew into diſrepute; but ſubſequent philoſophers ſeem to have had no heſitation in admitting, that our conceptions, though not in all caſes a teſt of truth, are yet a teſt of poſſibility. ‘ This, indeed,’ ſays Dr Reid, ‘ ſeems to be ‘ a neceſſary conſequence of the received doc‘ trine of ideas; it being evident, that there ‘ can be no diſtinct image, either in the mind, ‘ or any where elſe, of that which is impoſ‘ ſible.’

The maxim, in its fulleſt extent, is thus ſtated by Wolfius, (*Ontolog.*) ‘ Impoſſibile eſt ‘ cujus nullam notionem formare poſſumus; ‘ poſſibile e contra cui aliqua reſpondet notio.’ Other philoſophers have contented themſelves with ſtating one half of the propoſition; and have maintained, either the poſſibility of what may be conceived, or the impoſſibility of what we are unable to conceive. But a little reflexion is ſufficient to ſhew the fallacy of both tenets. For, in the firſt place, there are many things which we not only believe to be poſſible, but actually know to be true, ſuch as many phenomena, both of the natural and moral world; which yet we never could have conceived, had they not been actually exhibited to our obſervation: ſo that there are certainly many things poſſible, of which we have no conception.

Again, every propoſition which is true, ſtands oppoſed to another which is falſe; but no one will deny that the falſe propoſition may be as readily conceived as the true one. If the propoſition expreſs a truth which is neceſſary, as is the caſe with mathematical propoſitions, its oppoſite muſt be neceſſarily falſe, that is, impoſſible. Thus, the propoſition, 'any 'two ſides of a triangle are equal to the third 'ſide,' is not only falſe but impoſſible, and inconſiſtent with the very notion of a triangle; yet this propoſition may be as diſtinctly conceived as the oppoſite and true one, *viz.* 'any

‘ two ſides of a triangle are greater than the ‘ third ſide.’ Indeed, the ‘ demonſtratio ad abſurdum ’ proceeds upon the aſſumption, and, conſequently, complete conception, of a falſe and impoſſible propoſition ; and thence, by legitimate inferences, arrives at the demonſtration of the truth. It may, therefore, be held as clearly eſtabliſhed, that the faculty of conception furniſhes no teſt, either of poſſibility or impoſſibility.

The Logicians, who reduced all the operations of the human mind to three, *viz.* Simple Apprehenſion (or Conception), Judgment, and Reaſoning, included under the firſt of theſe, Senſation, Imagination, and what they called Pure Intellection. That Senſation is very improperly conſidered as a kind of conception, has been ſatisfactorily ſhewn by Dr Reid, who was alſo the firſt to point out in what Senſation truly conſiſted ; and the difference between it and the mental operation of Perception. (See

Chapters 2. & 3.) The diſtinction which the logicians make between imagination and pure intellection, is not, as might have been ſuppoſed, that the one is the conception or apprehenſion of objects of ſenſe, the other of objects of intellect, which might have been admitted as a juſt diviſion of the objects of conception: but, ſay they, in imagination, the image is in the brain; in pure intellection, it is in the intellect. When images have actually been diſcovered, either in the brain, or in the intellect, it will be time enough to examine into the juſtneſs of this diſtinction.

The circumſtance of conſidering ſenſation as a ſpecies of ſimple apprehenſion, ſeems to have given riſe to the doctrine taught by the logicians, that ſimple apprehenſion is the earlieſt exerciſe of the underſtanding, and furniſhes the mind with a ſtock of ſimple ideas, which are afterwards combined, by judgment and our other faculties, into various complex notions. It is juſtly obſerved by Dr Reid, that ‘ ſimple apprehenſion, though it be the ſimpleſt, is not the firſt operation of the underſtanding: and, inſtead of ſaying that the ‘ more complex operations of the mind are ‘ formed by compounding ſimple apprehenſions; we ought rather to ſay, that ſimple ‘ apprehenſions are got by analyzing more ‘ complex operations.’ ‘ It is generally allowed,’ ſays he, ‘ that we cannot conceive ‘ ſounds, if we have never heard; nor colours, ‘ if we have never ſeen: and the ſame thing ‘ may be ſaid of the objects of the other ſenſes. In like manner, we muſt have judged, ‘ or reaſoned, before we have the conception, ‘ or ſimple apprehenſion, of judgement and of ‘ reaſoning.’ (Eſſay 4. on the Intel. Powers, c. 3.)

It may, however, be doubted, whether this able philoſopher be equally correct in the analogous opinion, which he ſtates immediately afterwards,

wards. ‘ A ſimilar miſtake,’ ſays he, ‘ which ‘ is carried through the whole of Mr Locke's ‘ Eſſay, may be here mentioned. It is, that ‘ our ſimpleſt ideas, or conceptions, are got ‘ immediately by the ſenſes, or by conſciouſ‑ ‘ neſs; and the complex afterwards formed by ‘ compounding them. I apprehend it is far ‘ otherwiſe. Nature preſents no object to the ‘ ſenſes, or to conſciouſneſs, that is not com‑ ‘ plex. Thus, by our ſenſes, we perceive ‘ bodies of various kinds: but every body is ‘ a complex object; it has length, breadth, ‘ and thickneſs; it has figure, and colour, and ‘ various other ſenſible qualities, which are ‘ blended together in the ſame ſubject; and, ‘ I apprehend, that brute animals, who have ‘ the ſame ſenſes that we have, cannot ſepa‑ ‘ rate the different qualities belonging to the ‘ ſame ſubject, and have only a complex and ‘ confuſed notion of the whole: Such alſo ‘ would be our notions of the objects of ſenſe, ‘ if we had not ſuperior powers of under‑

‘ ſtanding, by which we can analyze the complex
‘ object, abſtract every particular attribute
‘ from the reſt, and form a diſtinct conception
‘ of it.’

Dr Reid concludes thus: ‘ So that it is ‘ not by the ſenſes immediately, but rather by ‘ the powers of analyzing and abſtraction, that ‘ we get the moſt ſimple and the moſt diſtinct ‘ notions even of the objects of ſenſe.’ This laſt obſervation, I think, muſt be admitted in its fulleſt extent; notwithſtanding which, the view given, in the above paſſage, of the manner in which the notions derived from the ſenſes are acquired, appears to me ſomewhat erroneous. It would ſeem to be Dr Reid's opinion, that the whole complex object of ſenſe is at once perceived, and that its various attributes are blended in the mind, and contemplated together as one whole. This, however, appears to me to be too great an effort for the perceptive faculty, eſpecially in its early ſtages; and it ſeems more natural to conclude, that it is by ſucceſſive acts of perception that an adequate notion is formed of objects which are in any degree complex.

Let us ſuppoſe that a child has, for the firſt time, a diſtinct object of ſight, as an apple, preſented before him; and let us examine what will be the notion formed in his mind. In my opinion, this notion will include nothing more than that of a coloured ſurface, of a certain form and dimenſion; that is, the child will perceive colour and extenſion, which perhaps are never ſeparated in the mind, but by a deliberate exerciſe of abſtraction. By ſucceſſive examinations of the apple, a notion of its ſpherical form, of its preciſe ſhape, of its ſmell and of its taſte, come to be acquired; and thus, by a combination of the reſults of ſucceſſive acts of perception, the complex notion attached to the word Apple is formed. Had we ſuppoſed the apple to be preſented to the touch of the child, and not to the eye, the firſt perception muſt have been that of hardneſs, combined probably with that of extenſion ; and the other attributes would have been made known by ſucceſſive perceptions, much in the ſame way here, as in the former caſe.

Thus, it ſeems natural to conclude, that the notions we acquire by the ſenſes are originally ſimple, at leaſt to a certain degree, and are afterwards combined, or rendered complex, as our acquaintance with the various attributes of the objects of nature becomes extended. In fact, the notion which the adult forms of an apple, is infinitely more complex than that of the child ; for this notion includes not only the form, colour, taſte, ſmell, &c. of the apple, but likewiſe that of its being the fruit of a certain tree, the ſeaſon at which it ripens, the places in which it grows, and various other particulars. Thus, as our experience enlarges, our knowledge of the attributes of objects extends ;

tends; and conſequently, the notions which we annex to the names of thoſe objects, become more and more complex.

At the ſame time, it muſt be obſerved, that the mind of the infant is ſo unconſcious of the ſucceſſive efforts by which it acquires a knowledge of the different attributes of natural objects, and theſe attributes come afterwards to be ſo intimately blended together by the influence of aſſociation, that they muſt be again analyzed by the faculty of abſtraction, before they can be contemplated by the mind in their moſt ſimple and uncombined ſtate. Thus, though the progreſs of our acquired experience, or acquaintance with the objects of nature, is *ſynthetical*; the progreſs of ſcientific inveſtigation, by which we obtain a more intimate knowledge of the true characteriſtics of thoſe objects, is in general analytical; and in many caſes it leads us to trace back the very ſteps by which the mind, unconſciouſly, formed an acquaintance with the objects of its knowledge. Of this laſt proceſs the minds of brutes ſeem to be utterly incapable; and conſequently, the notions they have of objects muſt always be inadequate and obſcure.

SECTION II.

Whether there is any Belief accompanying Conception.

It has been nearly the uniform doctrine of metaphyſical writers, as well the Logicians, as philoſophers of a more modern date, that conception, or imagination, is not accompanied with any belief of the exiſtence of its object. 'Perception,' ſays Dr Reid, (Eſſay 4. on the Intel. Powers, c. 1.), 'is attended with a be-

'lief of the preſent exiſtence of its object; 'Memory, with a belief of its paſt exiſtence; 'but Imagination is attended with no belief at 'all; and was therefore called by the ſchool-'men, *apprehensio simplex.*' Indeed, this doctrine is implied in the very definition of the faculty, and the explanation which is given of its proper functions. 'It is not,' we have ſaid in the preceding ſection, 'the province of 'conception either to affirm, or deny, or to 'expreſs any opinion or judgment, but mere-'ly to exhibit to the mind a notion of that 'object upon which it is exerciſed: Hence 'the terms *true* and *false* (i. e. *belief* or *dis-'belief*) are improperly applied to our con-'ceptions.'

Mr Stewart, in his Elements of the Philoſophy of the Human Mind, calls in queſtion this ſo generally prevalent opinion concerning Conception, though, as he himſelf expreſſes it, with great diffidence; and, notwithſtanding he has treated of Imagination and Conception as different faculties of the mind, yet he conſiders the obſervations which he has made on the ſuppoſed belief accompanying conception, as ‘ holding equally with reſpect to both faculties.’ (Elem. c. 3.) In examining his reaſons for deviating from the received opinion, it will however be proper to keep in view the ſenſe in which he employs the term Conception, *viz.* to denote ‘ that power of the mind which enables it to form a notion of an abſent object of perception, or of a ſenſation which it has formerly felt.’

‘ If,’ ſays Mr Stewart, ‘ it were a ſpecifical diſtinction between perception and imagination, that the former is always attended with belief, and the latter with none; then the more lively our imagination were of any object, and the more completely that object occupied the attention, the leſs ſhould we be apt to believe its exiſtence; for it is reaſon-

'able to think, that when any of our powers 'is employed ſeparately from the reſt, and 'there is nothing to withdraw the attention 'from it, the laws which regulate its opera'tion will be moſt obvious to our obſervation, 'and will be moſt completely diſcriminated 'from thoſe which are characteriſtical of the 'other powers of the mind. So very dif'ferent, however, is the fact, that it is matter 'of common remark, that when imagination 'is very lively, we are apt to aſcribe to its ob'jects a real exiſtence, as in the caſe of dream'ing, or of madneſs; and we may add, in the 'caſe of thoſe who, in ſpite of their own ge'neral belief of the abſurdity of the vulgar 'ſtories of apparitions, dare not truſt them'ſelves alone with their own imaginations in 'the dark. That imagination is, in theſe in'ſtances, attended with belief, we have all the 'evidence that the nature of the thing admits 'of; for we feel and act in the ſame manner 'as we ſhould do, if we believed that the ob-

'jects of our attention were real; which is the 'only proof that metaphyſicians produce, or 'can produce, of the belief which accompa'nies perception.' (*Ut ſupra.*)

This reaſoning is doubtleſs very ingenious; but, to me, it appears by no means concluſive. No juſt inference can, I think, be made, concerning the natural operation of the human faculties, from what takes place in madneſs, which is a diſeaſed ſtate of the mind; any more than we could deduce the true phyſiology of any organ of the human body, from an examination of it when in a ſtate of inflammation, or mortification. The ſame objection alſo applies, in a great meaſure, to any inference made from the phenomena of dreaming; where many of the mental faculties, as well as corporeal functions, are evidently ſuſpended; and, in particular, the influence of the will, or volition: ſo that the impreſſion of reality with which our conceptions are then attended, ſeems to ariſe from their being preſented ſpontaneouſly to the mind, and from our want of power to diſmiſs or recal them at pleaſure,

That ſtate of mind which is called a reverie, approaches very nearly to dreaming. The exerciſe of volition, then, appears almoſt to be at a ſtand: and the mind is delivered over to the ſpontaneous current of its ſucceſſive thoughts, which then obtrude themſelves upon it, as it were, without its own conſent; and, in conſequence, have a kind of temporary reality, ſimilar to what takes place in ſleep. But though the mind is occaſionally thus impoſed upon during the dreams, whether of the day or of the night; it ſurely by no means neceſſarily follows, that during the moments when its faculties are exerciſed in a more natural and deliberate manner, the ſame deception takes place.

Mr Stewart's poſition, ' that when any of 'the powers is employed ſeparately from the 'reſt, and there is nothing to withdraw the 'attention from it, the laws which regulate its 'operation will be moſt obvious to our ob- 'ſervation, and will be moſt completely diſ- 'criminated from thoſe which are characteriſ- 'tical of the other powers of the mind,' doubtleſs appears to be ſtrictly logical. But I do not apprehend that, in thoſe ſtates of the mind above deſcribed, in which our conceptions impreſs us with the conviction of their reality, the faculty in queſtion is deliberately, or naturally exerciſed. The phenomenon rather ariſes, as I have endeavoured to explain, from the involuntary obtruſion and ſpontaneous flow of the train of thought; which is not properly an immediate exerciſe either of conception or imagination, but a conſequence of the previous exerciſe of thoſe powers, and of the faculty of combination, or aſſociation, by which our various conceptions are ſucceſſively ſuggeſted to the mind. (See the next Section.)

Any man has it in his power to exerciſe the faculty of conception deliberately, and ſeparately from any other; and thus to ſubject to his own conſciouſneſs the truth or fallacy of the doctrine in queſtion. The reſult, I apprehend, will be contradictory to the ſuppoſition of a belief accompanying conception. Mr Stewart, indeed, diſtinctly expreſſes the contrary opinion. ' When,' ſays he, ' a painter ' conceives the face and figure of an abſent ' friend, in order to draw his picture, he be- ' lieves, for the moment, that his friend is ' before him.' If this be the caſe, Mr Stewart's concluſions muſt be admitted as well founded; but whether it be or be not the caſe, can, I apprehend, be determined only by the teſtimony of conſciouſneſs.

In the deliberate exerciſe of that peculiar kind of conception which we have called Imagination, I think the want even of a momentary belief is ſtill more apparent. To take another

other example from Mr Stewart. When Milton created his imaginary garden of Eden, according to our author, the aſſociation of ideas ſuggeſted to him, and the power of conception placed before him, a variety of ſtriking and beautiful ſcenes which he had formerly beheld; the power of abſtraction enabled him to ſeparate their beauties from their imperfections, and taſte directed him in the ſelection; by which means he has created a landſcape more perfect perhaps than has ever been realized in nature, (Elem. &c. c. 7.) Can it then be believed that Milton, even for a moment, had any belief in the real exiſtence of this paradiſe, which he ſo coolly and deliberately fabricated? As well, in my opinion, might we ſuppoſe that Cervantes believed his Don Quixotte actually to have routed a flock of ſheep, under the conviction of their being a hoſt of armed men; or that Rabelais really believed that there had exiſted ſuch gigantic and extraordinary perſonages as his Gargantua and Pantagruel.

A ſecond argument, in ſupport of the belief accompanying conception, is derived by Mr Stewart from what takes place in certain optical deceptions. The image of a lighted candle may, by means of a concave mirror, be made to appear in the air between the mirror and the eye of the obſerver; by the ſame means, the image of a flower may be preſented; and when the ſpectator attempts to lay hold of it, a ſtroke may be aimed at his hand by the image of a dagger. Even perſons who are acquainted with the principles of optics, act in theſe circumſtances, as if influenced by a belief in the reality of theſe illuſions; and have a momentary repugnance at expoſing themſelves to the viſionary danger. In a ſimilar way, by the contrivance of a common ſhew-box, the mind may be led to form the conception of a widely-extended and variegated proſpect, although it has a ſpeculative conviction that the ſphere of its viſion only extends to a few inches.

Theſe, and ſimilar inſtances, appear to afford examples of what Mr Stewart calls ‘ the ‘ compatibility of a ſpeculative diſbelief of the ‘ exiſtence of an object, with a contrary mo‘ mentary belief.’ But let it be obſerved, that the faculty exerciſed in ſuch caſes is not Conception or Imagination, but *Perception*, of which it is an eſſential requiſite to be accompanied with belief. The image of the candle, of the flower, and dagger, and the magnified ſcene of perſpective, are real objects of ſight, and as ſuch, are properly calculated to produce a conviction of reality: this conviction, however, is deſtroyed, when it is diſcovered that theſe are nothing but images; and a little practice will enable any perſon, whether optician or not, to hold his finger in the image, either of the candle or of the dagger, without even a momentary apprehenſion. Theſe illuſions, therefore, are upon the ſame footing with other deceptions of ſight, ſuch as the erroneous notions of magnitude, diſtance, colour, form, &c. which are originally derived from the eye, but which come to be corrected by the juſter teſtimony of the ſenſe of touch; ſo that the falſe belief to which they are calculated to give riſe, ſoon ceaſes for ever.

The circumſtances accompanying the exhibition of fictitious ſcenes of diſtreſs; and the dread which is felt in ſituations of imaginary danger, afford additional arguments to Mr Stewart, in ſupport of the doctrine in queſtion. ‘ I believe, ’ ſays our author, (Elem. &c. c. 3.) ‘ it will be found that the ‘ violent emotions which are ſometimes pro‘duced by the diſtreſſes of the ſtage, take ‘ their riſe, in moſt caſes, from a momentary ‘ belief that the diſtreſſes are real. I ſay, in ‘ moſt caſes; becauſe, I acknowledge that, in‘dependently of any ſuch belief, there is ſome‘thing contagious in a faithful expreſſion of ‘ any of the paſſions. The emotions pro‘duced by tragedy are, upon this ſuppoſition,

‘ ſomewhat analogous to the dread we feel
‘ when we look down from the battlement of
‘ a tower. In both caſes, we have a general
‘ conviction that there is no ground for the
‘ feelings we experience; but the momentary
‘ influences of imagination are ſo powerful, as
‘ to produce theſe feelings, before reflection has
‘ time to come to our relief.’

The emotions which are excited in ſuch caſes as theſe, may, I think, be more ſatisfactorily explained by the operation of another well known principle of the human conſtitution, I mean *sympathy;* in conſequence of which, we enter into the condition of another perſon, even when that condition is only forcibly deſcribed or repreſented to us; and feel, in ſome degree, the pain or pleaſure that we think we ſhould feel if we were really in that condition. It is not neceſſary, for the exerciſe of ſympathy, that thoſe with whom we ſympathize ſhould have the ſame ſenſe of their condition as we have. Thus, we bluſh for another's ill-breeding, even when he himſelf is not aware of it; and we pity a madman, though we believe him to be happy in his frenzy. Nay, we ſympathize with the lower animals, and even with the inanimate objects of nature; we rejoice in the ſong of the lark, or the ſporting of the lamb; and we lament the fallen grandeur of a venerable decayed oak, or ancient Gothic ruin.

In conſequence of this principle, then, our emotions may be ſtrongly raiſed by an exhibition of fictitious diſtreſs, without even a momentary belief in the reality of the diſtreſs; becauſe we ſympathize with thoſe who have by no means the ſame ſenſe of their condition as we have. And this ſerves to explain a circumſtance, with reſpect to narratives of diſtreſs, which has appeared not a little paradoxical, *viz.* that our emotions may be as ſtrongly raiſed by a pure fiction, as by a detail of events which have actually happened in the world; and by the exhibition of characters which have really been in the ſituations aſſigned to them. If the feelings of nature be juſtly expreſſed, in the details of the compoſition which is purely fictitious, ſympathy will be as completely excited, and, conſequently, emotion as ſtrongly raiſed, as by an accurate narrative of real ſufferings of the ſevereſt kind.

The momentary terror which is excited by looking down a precipice, or from the top of a high building, even when we believe ourſelves in a ſtate of perfect ſafety, may be accounted for on ſimilar principles. We figure to ourſelves a perſon in the act of falling down the precipice, and our ſympathy is rouſed for the creature of our own imagination, without the neceſſity of even a momentary belief of the reality of the accident. By a ſimilar operation of ſympathy, we tremble for a maſon ſtanding on a high ſcaffold, though we know that cuſtom has rendered the ſituation quite familiar to him; and ſurely, here, there cannot be any belief that the maſon is falling; as we have a ſtrong and diſtinct perception of the contrary. The operation of ſympathy will alſo ſerve to account for much of the apprehenſion of ſupernatural danger, to which many perſons are liable in the dark. But ſome of this, I think, ſhould be aſcribed to a real belief in the poſſibility of ſuch danger, which will lurk in the minds even of the moſt rational part of mankind, in ſome degree unknown to themſelves.

But although we deny belief, however tranſient, to be an inherent accompaniment to the faculty of Conception or Imagination; yet belief may be, and very frequently is, attached to certain operations of the imagination, which are then miſtaken for realities, and produce as remarkable effects upon the individual, as if they were the very things they are miſtaken for. The facts of this kind, which are both numerous and well eſtabliſhed, furniſh ſome of the moſt ſingular, and, at the ſame time, inexplicable phenomena of the human mind.

Thoſe unfortunate perſons who are in the ſtate of hypochondriacs, or imaginary invalids, furniſh ſome ſtriking examples of this truth. The wildeſt ſuggeſtions of the imagination, impreſs upon them the full conviction of reality; and all the reaſoning of their friends or phyſicians is inſufficient to convince them that they are formed like other men, and have not ſome part of their bodies, either unnaturally diſtorted, or faſhioned of materials different from fleſh and blood. When hypochondriaſis arrives at this height, it makes a near approach to certain ſtages of madneſs; and if the phyſician ſhould deny that the bodily diſeaſe exiſts, of which his patient complains, he muſt yet allow that there is a real diſeaſe of the mind.

But, even when the intellects are in a

comparatively ſound ſtate, the viſions of the imagination may be made to produce, in certain perſons, all the effects of reality. The ſucceſs of certain empirical impoſitions, among which we may particularize the Animal Magnetiſm of Meſmer, and the Tractors of Perkins, ſufficiently eſtabliſh this fact. The reign of Animal Magnetiſm is now over; but it will be remembered how rapidly its fame was circulated, and with what avidity its wonders were detailed. The moſt incredulous could not deny the reality of its effects; as convulſions were produced, and ſtrong bodily agitations excited, in perſons who could not be ſuſpected of lending their aid to the impoſture. But the examination of the Academy of Sciences at Paris diſpelled the illuſion, and ſatisfactorily eſtabliſhed that, as far as the effects were real, they were to be aſcribed merely to the influence of the imagination.

The more modern quackery of the Metallic

Tractors, ſeems fairly reducible to the ſame claſs. If theſe have ever produced a real cure, the effect is to be aſcribed to the influence of the imagination, and not to the virtue of the metal. This ſeems, indeed, to be completely eſtabliſhed by Dr Haygarth; who found that his patients thought themſelves equally benefited, whether he employed the tractors of Perkins, or tractors of his own manufacture, or even tractors of wood, coloured ſo as to reſemble thoſe of metal. (See his Treatiſe on Imagination, as a Cauſe and Cure of Diſeaſes.)

This influence of the imagination on the corporeal frame, forms one feature of the myſterious union between the body and the mind, in conſequence of which, the one cannot be affected without ſome correſponding change in the other; an union ſo difficult to be comprehended; although of its reality we have the teſtimony of our daily experience.

SECTION III.

Of the Train of Thought.

EVERY one is conſcious of a conſtant ſucceſſion, or train of thoughts which paſſes through his mind while he is awake; ſo that one thought continually ſuggeſts another, which, in its turn, introduces another, and ſo on, even without the intervention of external objects. Sometimes the ſucceſſion of thoughts is rapid, and their ſuggeſtions lively; at other times, they ſucceed each other more languidly, and ſcarcely excite our attention; but it may be conſidered as an invariable law of the human mind, that, during its waking hours, it is never wholly without ſome object of reflection.

This current of thought appears to paſs through the mind, without any volition, or active effort of the individual, inſomuch, that it requires an active effort to ſtop its natural flow, and to ſingle out ſome one particular object for conſideration; and no effort of the will is ſufficient, entirely to diſmiſs the train of thought, or to reduce the mind to an unconſcious and unthinking ſtate. So completely, indeed, is the mind in a paſſive condition, with reſpect to the ſucceſſion of its thoughts, that, as has been remarked by Lord Kaimes, (Elements of Criticiſm,) we are unable to call up in the mind any particular object at pleaſure, although previouſly acquainted with it; for the very circumſtance of thinking of this object proves it to have been already ſuggeſted to the mind.

If it be aſked, What is the cauſe of the ſucceſſion of our thoughts, if this does not depend upon the volition of the perſon who thinks? It may be anſwered, That it is the relations or combinations previouſly eſtabliſhed among the objects of thought, in conſequence of which one of theſe ſuggeſts another *in infinitum.* Sometimes theſe relations are obvious, and eaſily traced; at other times, it may be a matter of ſome difficulty to detect the principle of combition, by which a tranſition from one thought to another was regulated; but a little attention will ſerve to convince us that, in all caſes, the ſucceſſion of our thoughts is occaſioned by previous combinations and aſſociations eſtabliſhed among them.

Mr Hobbes (in his Leviathan) has given an ingenious illuſtration of this frequently imperceptible ſource of tranſition, in the particulars of a ſuppoſed or real converſation. ‘ In a company,’ ſays he, ‘ in which the ‘ converſation turned upon the civil war, what ‘ could be conceived more impertinent, than ‘ for a perſon to aſk abruptly, What was the

‘ value of a Roman denarius? On a little ‘ reflection, however, I was eaſily able to trace ‘ the train of thought which ſuggeſted the ‘ queſtion; for the original ſubject of diſ‑ ‘ courſe naturally introduced the hiſtory of ‘ the King, and of the treachery of thoſe who ‘ ſurrendered his perſon to his enemies; this ‘ again introduced the treachery of Judas ‘ Iſcariot, and the ſum of money which he ‘ received for his reward.’

As, then, the train of thought goes on ſpontaneouſly in the human mind, in conſequence of aſſociations previouſly eſtabliſhed among our ideas; and as no thought can be called up in the mind, which had not previouſly offered itſelf to its conſideration, it would ſeem to follow, that man has no controul whatever over his thoughts, but is, in this reſpect, a mere involuntary agent. This conſequence has, accordingly, been drawn from theſe very premiſes; and, in particular, has been fully illuſtrated by Lord Kaimes, (Elements of Criticiſm); but a little reflexion will ſerve to ſhew that it, by no means, neceſſarily follows.

Although the train of thought moves on continually without any voluntary effort; yet we are not without very conſiderable powers over it. For, not to mention the influence of external circumſtances and converſation, in conſequence of which, by a change of ſituation, we can always produce a change in our thoughts; we can, moreover, as it were, ſtop the ſpontaneous current of our thoughts, by ſingling out ſome one idea at pleaſure, detaining it in the mind, and making it a particular object of attention. The conſequence of this is, that we bring into view the leſs obvious connexions among our thoughts, and thus divert their current into an entirely new channel. In this way, we may be ſaid to poſſeſs, in ſome degree, a power of recalling to the mind a circumſtance which was not immediately ſuggeſted to it.

For, ſuppoſe the train of my thoughts ſhould bring to my remembrance, a company in which I had lately been, and where ſome intereſting converſation had paſſed, which, however, I did not diſtinctly recollect: By dwelling upon the various circumſtances which happened at that time, I may, at length, ſucceed in recollecting the converſation in queſtion; and thus, by an active effort, I recover a ſtock of ideas, which would otherwiſe have been loſt.

'We ſeem,' ſays Dr Reid, (Eſſay IV. on the Intellectual Powers, c. 4.) 'to treat the 'thoughts that preſent themſelves to the fancy 'in crowds, as a great man treats thoſe that 'attend his levee. They are all ambitious of 'his attention; he goes round the circle, be'ſtowing a bow upon one, a ſmile upon ano'ther; aſks a ſhort queſtion of a third, while 'a fourth is honoured with a particular con'verſation; and the greater part have no par'ticular mark of attention, but go as they

‘ came. It is true, he can give no mark of his ‘ attention to thoſe who were not there; but ‘ he has a ſufficient number for making a ‘ choice and diſtinction.’

But by far the moſt important controul which we poſſeſs over the train of our thoughts is, the power which we have in directing thoſe original aſſociations and combinations, by which their ſucceſſion is regulated. In this manner, we faſhion, as it were, the very train of thought itſelf, and furniſh the materials for our future mental inveſtigations. We have already had occaſion to obſerve, (c. 5. § 3.) of what importance it is, in the early periods of life, to direct, and duly ſuperintend, that principle of the human conſtitution by which we are led to combine together the different objects of our knowledge, according to various relations, either natural or arbitrary. The preceding remark tends to ſet this obſervation in the ſtrongeſt point of view; as it leads to the concluſion, that the character, and mental endowments of the individual, principally depend upon the direction which is given to this important part of the human conſtitution.

The effect of a ſedulous cultivation, and reiterated practice, in giving us a ſelf-command in this particular, are well illuſtrated by Dr Reid, in the following paſſage: 'The habits,' ſays he, 'which the human mind is capable 'of acquiring by exerciſe, are wonderful in 'many inſtances; in none more wonderful, 'than in that verſatility of imagination which 'a well-bred man acquires by being much 'exerciſed in the various ſcenes of life. In the 'morning, he viſits a friend in affliction. Here, 'his imagination brings forth from its ſtore 'every topic of conſolation; every thing that is 'agreeable to the laws of friendſhip and ſympathy, and nothing that is not ſo. From thence 'he drives to the miniſter's levee, where imagination readily ſuggeſts what is proper to

‘ be ſaid or replied to every man, and in what ‘ manner, according to the degree of acquaintance or familiarity, of rank or dependence, ‘ of oppoſition or concurrence of intereſts, of ‘ confidence or diſtruſt that is between them. ‘ Nor does all this employment hinder him ‘ from carrying on ſome deſign with much ‘ artifice, and endeavouring to penetrate into ‘ the views of others through the cloſeſt diſguiſes. From the levee he goes to the ‘ Houſe of Commons, and ſpeaks upon the ‘ affairs of the nation; from thence to a ball ‘ or aſſembly, and entertains the ladies. His ‘ imagination puts on the friend, the courtier, ‘ the patriot, the fine gentleman, with more ‘ eaſe than we put off one ſuit, and put on another.’ (Eſſay IV. on the Intellect. Powers, c. 4.)

The ſame author has admirably illuſtrated the various characters which the train of thought aſſumes in different individuals, and its influence upon the happineſs of men, at the end of the above quoted chapter. 'The human imagination,' ſays he, 'is an ample theatre, upon 'which every thing in human life, good or 'bad, great or mean, laudable or baſe, is acted. 'In children, and in ſome frivolous minds, it 'is a mere toy-ſhop. And, in ſome, who exerciſe their memory without their judgment, 'its furniture is made up of old ſcraps of 'knowledge, that are thread-bare and worn 'out. In ſome, this theatre is often occupied 'by ghaſtly Superſtition, with all her train of '*gorgons, and hydras, and chimeras dire.* 'Sometimes it is haunted with all the infernal demons, and made the forge of plots, 'and rapine, and murder. Here, every thing 'that is black and deteſtable is firſt contrived, 'and a thouſand wicked deſigns conceived that 'are never executed. Here, too, the Furies 'act their part, taking a ſevere, though ſecret 'vengeance, upon the ſelf-condemned criminal. How happy is that mind, in which

‘ the light of real knowledge diſpels the phantoms of ſuperſtition: In which the belief and reverence of a perfect all-governing mind caſts out all fear, but the fear of acting wrong: In which ſerenity and cheerfulneſs, innocence, humanity, and candour, guard the imagination againſt the entrance of every unhallowed intruder, and invite more amiable and worthier gueſts to dwell!’

The whole, indeed, of Dr Reid’s obſervations upon the train of thought, contained in this chapter, is in the higheſt degree intereſting and judicious. Among other matters will be found ſome ſenſible remarks upon that difficult ſubject, the gradual developement of the train of thinking in the minds of children. If, to what this author has ſaid upon the train of thought, be added Mr Stewart’s philoſophical inveſtigations on the ſame ſubject, contained in the 5th chapter of his Elements, &c. part 1. ſect. 3. & 4., little appears to be wanting to complete our notions upon this important ſubject.

Mr Stewart, in a ſubſequent ſection, goes on to apply the principles which he has eſtabliſhed to the explanation of the phenomena of dreaming; in which inquiry he has diſplayed great ingenuity, and a truly philoſophical ſpirit of inveſtigation. I have only to obſerve upon his intereſting diſquiſitions on this head, that there appears to me to be no neceſſity for reſorting to a belief, which at all times, and of natural conſequence, accompanies our conceptions and imaginations, in order to account for the impreſſion of reality which is produced by our dreams. In conſequence of the ſuſpenſion of the influence of the will over our mental operations during ſleep, the train of thought then goes on in the mind wholly involuntarily; and we loſe that degree of controul over it which we poſſeſs when awake. This circumſtance, I think, of itſelf ſufficiently explains why its ſuggeſtions are miſtaken for realities, becauſe we have then no power whatever of diſmiſſing and recalling them at pleaſure.

CHAP-

CHAPTER SEVENTH.

Of Memory.

SECTION I.

Analysis of the Faculty.

THE faculty of Memory is ſo familiarly known to all men, and its exerciſe is ſo conſtant, and commences at ſo early a period of life, that to attempt any preciſe definition of it, appears to be ſuperfluous. In order, however, to diſtinguiſh it from other faculties with which it has an intimate relation, I ſhall deſcribe it as being that faculty, by means of which we have an immediate knowledge of what we have formerly perceived, felt, or thought.

As there is none of our faculties with which we are more familiarly acquainted than Memory, ſo there is none upon which more has been written by philoſophers, or concerning which we have a greater variety both of uſeful practical remarks, and of viſionary ſpeculations. Reaſoning from a ſuppoſed analogy between the properties of matter and of mind, that fruitful ſource of falſe concluſions, has here been employed with great readineſs; and the hypotheſis of images, or repreſentations, of things preſent in the mind, has been conſidered as receiving a very ſtrong proof from the operation of memory. Indeed, the analogy between committing a thing to memory, and delineating it upon a blank tablet, is one of the ſtrongeſt that can be pointed out between an intellectual and corporeal proceſs, and has therefore naturally influenced the diſquiſitions of philoſophers concerning Memory.

The Platoniſts and Peripatetics inform us, that thoſe pictures, or repreſentations, of external objects, which enter the mind through the ſenſes, leave an impreſſion, or image, upon our original ſenſorium; which impreſſion, when the external object is no longer preſent, remains, and becomes the cauſe of memory. Upon this principle Ariſtotle imputes the ſhortneſs of memory in children to this cauſe, that their brain is too moiſt and ſoft to retain the impreſſions made upon it; and the defect of memory in old men, he imputes, on the contrary, to the hardneſs and rigidity of the brain, which hinders its receiving a firm impreſſion.

Deſcartes, though favourable to the doctrine of impreſſions, has here ſuperadded a mechanical theory of his own. According to him, all impreſſions of external objects being conveyed to the ſoul, at the pineal gland, through the different nerves, when any motions of the ſpirits, which, according to him, are contained in the nerves, are made in the ſame traces in which former motions were performed; by this means we have memory. The doctrine of Malebranche was very ſimilar. He compared the fibres of the brain receiving impreſſions from the current of the animal ſpirits, to the branches of a tree, which, being bent after a particular manner, retain a facility of being bent afreſh in the ſame manner; and hence, ſaid he, we have memory, which conſiſts only in a promptneſs, or facility, of renewing the ſame impreſſions.

Mr Locke, and his followers, ſpeak with more reſerve on this ſubject, although they ſeem to admit the ſame cauſe of memory, *viz.* traces, or marks, of former perceptions. The images of things, which, according to Mr Locke, are preſent in the mind in all its operations, he repreſents as being laid up in the memory as in a ſtorehouſe, whence they may be occaſionally drawn and contemplated without the aid or repetition of the original impreſſions by which thoſe images were formed. But the images thus depoſited in the memory are ſuppoſed gradually to decay, and, unleſs occaſionally renewed by the ſenſes, at length totally to diſappear. The interval, or diſtance, between two images, or ideas, contemplated in the memory, is ſuppoſed by Mr Locke to furniſh us with the notion of duration.

Mr Hume having diſcarded every object of knowledge, or belief, except his impreſſions and ideas, maintains that memory and imagination differ in nothing but the vivacity of the ideas which are their object. The ideas of memory he conſiders as ſomething intermediate between the impreſſions which are the objects of the ſenſes, and the ideas which more properly belong to the imagination. Hence, as the objects of memory and imagination differ only in degree, they may be conſidered as convertible, and the ideas of the one may be miſtaken for thoſe of the other. The conſequence is, that truth and falſehood are convertible, and proof of any kind altogether impoſſible.

It will not be neceſſary to enter into a ſerious refutation of theſe fallacious theories, ſince they reſt upon no other foundation than the hypotheſis of ideas, traces, or images preſent in the mind, and furniſhing objects for its various operations; an hypotheſis which has been amply diſcuſſed already, (See ch. 2. § 1.) If any further examination of the various theories concerning Memory, is deemed neceſſary, it will be found very ſatisfactorily accompliſhed by Dr Reid (Eſſay 3, on the Intel. Powers, c. 7.)

The truth appears to be, that of the preciſe manner in which the memory operates, we ought candidly to confeſs our ignorance. We know that we are poſſeſſed of a certain power, which enables us, in certain circumſtances, to recal to the mind paſt occurrences; but of the connexion between thoſe occurrences, and this power of our minds, we know nothing; and, had we not been endowed with ſuch a power, we ſhould probably have deemed it as incredible, and as difficult of comprehenſion, as a power which ſhould give us a foreknowledge of future events: for there does not appear to be any more neceſſary connexion between the paſt and the preſent, than between the preſent and the future.

At the ſame time, the evidence which Memory carries along with it, of the exiſtence of the events which are its object, is indiſputable. Upon the evidence of Memory, when clear and diſtinct, we, without ſcruple, reſt the moſt important concerns of life; nor is this evidence at all inferior in degree to that of the ſenſes, or of abſolute demonſtration. But it cannot be reſolved into the evidence either of ſenſe, or of any proceſs of reaſoning; but muſt be ſtated as a peculiar kind of evidence, which we are ſo conſtituted, as to admit of itſelf, immediately and inconteſtably.

This evidence, or belief, of paſt exiſtence, which always accompanies memory, forms one important diſtinction between that faculty and the power of aſſociation, or combination, into which ſome have been inclined to reſolve all the phenomena of memory. The ſuggeſtions which are made by the faculty of aſſociation alone, impreſs us with no belief of their reality. In fact, the very materials upon which they are employed, if not ſupplied by the immediate perception of the moment, muſt be furniſhed by the memory, or that faculty which enables us to treaſure up paſt knowledge. Thus the power of aſſociation, in its moſt uſual exerciſe, preſuppoſes the power of memory; and when, during the ſpontaneous flow of the current of thought, we recognize a combination of which we had formerly been conſcious, and diſtinguiſh it from one newly formed, this neceſſarily implies an exerciſe of a faculty which can diſtinguiſh former knowledge from new; which is not an attribute of the faculty of aſſociation, but of the memory alone. ‘ It is ‘ poſſible, ſurely, ’ ſays Mr Stewart, (Elem. &c. c. 6. § 1.) ‘ that our thoughts might have ‘ ſucceeded each other according to the ſame ‘ laws as at preſent, without ſuggeſting to us ‘ at all the ideas of the paſt ; and, in fact, this ‘ ſuppoſition is realized to a certain degree in ‘ the caſe of ſome old men, who retain pretty ‘ exactly the information which they receive, ‘ but are ſometimes unable to recollect in what ‘ manner the particulars which they find con‘ nected together in their thoughts at firſt came ‘ into the mind ; whether they occurred to ‘ them in a dream, or were communicated to ‘ them in converſation. ’

In ſuch a caſe as this, we have an example of the power of aſſociation operating without any aid from the memory. In ſome inſtances of active and voluntary recollection, we ſeem to have examples of the faculty of memory operating without any aid from the aſſociating principle. But it muſt be acknowledged that, in moſt caſes, the ſuggeſtions of memory are made by means of the combinations previouſly eſtabliſhed among our thoughts. This, however, is but one part of the province of memory; for, as obſerved by Mr Stewart, 'this 'faculty implies two things; a capacity of re'taining knowledge, and a power of recalling 'it to our thoughts when we have occaſion to 'apply it to uſe.' (*ut supra.*) The firſt of theſe is entirely independent of the faculty of combination; but this faculty is the principal, though not the ſole inſtrument, by which the latter purpoſe is accompliſhed. The advantages of this law of our nature are well ſtated by Mr Stewart, in the following paſſage: 'On 'the other hand,' ſays he, 'it is evident, 'that without the aſſociating principle, the 'power of retaining our thoughts, and of re'cognizing them when they occur to us, would 'have been of little uſe; for the moſt import'ant articles of our knowledge might have re'mained latent in the mind, even when thoſe 'occaſions preſented themſelves to which they 'are immediately applicable. In conſequence 'of this law of our nature, not only are all our 'various ideas made to paſs from time to time 'in review before us, and to offer themſelves 'to our choice as ſubjects of meditation; but, 'when an occaſion occurs which calls for the 'aid of our paſt experience, the occaſion it'ſelf recals to us all the information upon the 'ſubject which that experience has accumu'lated.' (*ut supra.*)

Mr Stewart has very candidly ſtated a difficulty, which the belief of paſt exiſtence, accompanying memory, preſents to his doctrine of a belief of preſent exiſtence, accompanying every act of conception; a doctrine which we examined at ſome length in Chapter 6. ſect. 2. 'It is evident,' ſays he, 'that when I think 'of an event, in which any object of ſenſe 'was concerned, my recollection of the event 'muſt neceſſarily involve an act of conception. 'But every act of recollection which relates to 'events, is accompanied with a belief of their 'paſt exiſtence. How then are we to recon-'cile this concluſion with the doctrine former-'ly maintained concerning conception, accord-'ing to which, every exertion of that power is 'accompanied with a belief that its object ex-'iſts before us at the preſent moment?' The ſolution he gives of the difficulty is, that the firſt act of the mind, in ſuch caſes, is the belief of preſent exiſtence which accompanies conception; and that, afterwards, a judgment is formed from circumſtances, or by the proper exerciſe of memory, of the period of time to which the thing in queſtion is to be referred. He however ſubjoins, that although he is himſelf ſatisfied with this ſolution, he is far from expecting that all his readers will be ſo. The difficulty, indeed, may fairly be ſtated, as an additional argument to thoſe detailed in the above mentioned Section, againſt the reality of a belief accompanying conception.

I muſt likewiſe claim the liberty of differing from this ingenious philoſopher in another point, which naturally comes to be conſidered here. He ſtates the exerciſe of the memory as depending principally upon two faculties of the mind, the Aſſociation of Ideas, and Attention. The connexion between Memory and the faculty of Aſſociation, we have juſt been endeavouring to illuſtrate; and the dependence of Memory upon the exerciſe of Attention, taking that word in its common acceptation, cannot be denied: the point which I think controvertible is, the conſidering Attention as a diſtinct faculty of the human mind, which has its own peculiar objects, juſt as Memory, Abſtraction, or Perception have.

Mr Stewart has a very ingenious and intereſting chapter on the ſubject of Attention, (Elem. &c. c. 2.), in which he ably illuſtrates that law of our nature, in conſequence of which, if ſome attention be not given to the objects of our thoughts, that is, if they be not retained in the mind for a certain period of time, (perhaps to the excluſion of every other thought for that period), they will leave no trace behind them, and never be recollected, even the next ſucceeding moment. Theſe reaſonings ſerve to explain the curious fact, that there are many currents of thought, and even proceſſes of reaſoning, which paſs through the mind ſo rapidly, that we remain for ever unconſcious of them; of which ſome examples have been given in our chapter upon Conſciouſneſs, (c. 1.)

Still, however, though I admit the juſtneſs and the utility of theſe illuſtrations, I can ſee no neceſſity for aſſigning to the mind a peculiar faculty called Attention, whoſe office it is to take previous cognizance of our various thoughts, in order that they may be again recognized by the memory. I can find no peculiar objects for the employment of this faculty, which do not belong to ſome one or other of thoſe whoſe exiſtence ſeems to be certainly eſtabliſhed. Whatever is afterwards remembered, is either an object of the ſenſes, that is, of the faculties of ſenſation and perception; or, it is ſome mental abſtraction, ſome real or fancied relation, ſome object of conſciouſneſs or conception; in ſhort, of ſome one or other of thoſe mental faculties which are contained in the enumerations of Pneumatology, without, however, reſorting to this diſputed one of Attention. Thus, the Attention, if if it be a peculiar faculty, muſt be a generally aſſiſting faculty, which comes occaſionally to the help of all the others, to give them clearer views of their ſeveral objects.

Inſtead of adopting this concluſion, I would be inclined to reject the exiſtence of the faculty altogether, and conſider the meaning of the term *Attention*, or of *doing a thing attentively*, to be no more than a ſedulous and ſteady exertion of the particular mental power then in queſtion, whether it be Perception, Abſtraction, Combination, or any other. To aſſert the contrary doctrine, appears to be nearly as inconſiſtent as to ſay, that, when a man lifts a burden of a hundred pounds weight, he muſt exert a muſcular power, different in kind, as well as in degree, from that by which he is enabled to lift a weight of ten pounds. The rapid currents of thought which paſs in our minds, generally unknown to ourſelves, and which afford the moſt plauſible argument for the neceſſity of a peculiar faculty, of the nature of Attention, appear to me to be proper objects, not of Attention, but of Conſciouſneſs, and, as ſuch, have been conſidered in Chapter 1ſt.

Mr Stewart ſeems likewiſe to have fallen into an error, in conſidering himſelf as the firſt writer who has treated of Attention as a diſtinct faculty of the human mind. ‘ Although,’ ſays he, (Elem. &c. c. 2.) ‘ the connexion
‘ between Attention and Memory has been
‘ frequently remarked in general terms, I do
‘ not recollect that the power of Attention has
‘ been mentioned by any of the writers on
‘ Pneumatology, in their enumeration of the
‘ faculties of the mind ; nor has it been conſidered
‘ by any one, ſo far as I know, as of
‘ ſufficient importance to deſerve a particular
‘ examination. Helvetius, indeed, in his very
‘ ingenious work *De l'Esprit*, has entitled one
‘ of his chapters, “ *De l'inegale capacité*
“ *d'Attention ;* ” but what he conſiders under
‘ this article, is chiefly that capacity of patient
‘ inquiry, (or, as he calls it, “ *une attention*
“ *suivie*), ” upon which philoſophical genius
‘ ſeems, in a great meaſure, to depend. He
‘ has alſo remarked, with other writers, that
‘ the impreſſion which any thing makes on the

'memory, depends much on the degree of 'attention we give it; but he has taken no 'notice of that effort which is abſolutely ne'ceſſary to the loweſt degree of memory.' Conſidering Mr Stewart's acquaintance with the writings of Condillac, it is rather ſingular that he ſhould not have known that that author treats of Attention as a peculiar faculty of the human mind; (See his *Essai sur l'Origine des Connaissances Humaines*, § 2. c. 1.); more eſpecially as we find in this author (See the ſame Chapter) a diſtinct illuſtration of the very doctrine here ſtated by Mr Stewart, *viz.* 'That our thoughts and perceptions muſt 'have become, for a certain time, objects of '*attention*, before they leave any traces at all 'on the mind.' *

The decay of memory in old men, is a matter of familiar obſervation, as well as that peculiarity with which it is uſually accompanied,

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* See alſo the introduction to the 'Cours d'Etude,' and the beginning of the 'Art de Penſer' of Condillac.

nied, *viz.* that a complete, and even minute recollection, uſually remains of the events of an older date, and the occurrences of early life. The cauſe of the failure of memory, in regard to recent occurrences, is uſually ſaid to be the decay of Attention, in conſequence of which, theſe occurrences do not make a ſufficient impreſſion on the mind to be afterwards recollected, while, at the ſame time, the aſſociating principle remaining in full vigour, and the train of thought continuing to perform its office, circumſtances which have been already familiarized to the mind are ſtill ſuggeſted with the wonted accuracy. This explanation may be admitted as ſatisfactory, if we underſtand, by a decay of attention, not the diminiſhed energy of ſome one peculiar faculty of the mind, but the relaxed vigour of all, or moſt of the mental faculties, which, like the bodily functions, being impaired by the approach of age, are incapable of contemplating their reſpective objects with that degree of

force

force which is requiſite to their being diſtinctly remembered afterwards. The decay of ſenſibility, and extinction of paſſion, which are the conſequences of old age, likewiſe powerfully cooperate in producing this effect, by diminiſhing the intereſt which the common occurrences of life are calculated to produce.

That kind of memory which old men poſſeſs, generally in a ſtate of vigour, by which circumſtances are preſented ſpontaneouſly to the mind without any voluntary effort, has been called Reminiſcence, or Remembrance; while that which requires a more vigorous effort, and is more dependent upon the will of the individual, has been diſtinguiſhed by the name of Recollection. The former, as above mentioned, is chiefly dependent upon the faculty of Aſſociation; while the latter will not be found, but where the mind is capable of that active exertion of its faculties called Attention.

The diſtinction is as old as Ariſtotle, (*De Memor. & Reminisc.*) who remarks, that the brutes poſſeſs the firſt kind of memory, but exhibit no traces of the laſt; which is therefore a valuable characteriſtic of man.

To the exerciſe of memory, we appear to be entirely indebted for the notion of Time, or Duration, which a being, deſtitute of that faculty, could never have poſſeſſed. Dr Reid has clearly pointed out the fallacy of Mr Locke's doctrine, which derives the notion of duration from a contemplation of the interval or diſtance between two ideas which we have acquired ſucceſſively. (Eſſay III. on the Intel. Powers, c. 5.) As theſe ideas muſt, by the ſuppoſition, be both preſent in the mind at once, the idea of ſucceſſion, or of time, is by no means neceſſarily included in the diſtance between them, unleſs we call in the aid of Memory, which informs us that we acquired the one idea before we acquired the other.

Such information as this, is the proper buſineſs of the faculty of Memory; which therefore, alone, and of itſelf, neceſſarily includes the notion or idea of Succeſſion, and of Duration. It has farther been obſerved, that, without Memory, we could have had no idea of ſuch a thing as Motion, which, being a *ſucceſſive* change of place, preſuppoſes the notion of ſucceſſion or duration.

The notion of a limited duration, which we diſtinctly remember, leads us, by a kind of neceſſity, to the admiſſion of a duration which has no limits—which neither began, nor will have an end. In like manner, the notion of limited extenſion and magnitude, which we acquire by the ſenſes, leads us to the belief of an unlimited extenſion, or of ſpace which has no boundaries. Thus are acquired the notions of infinite ſpace, and of infinite time, or eternity. It cannot, however, be pretended, that our finite capacities are capable of forming adequate conceptions of theſe immenſe and unbounded attributes; it can only be ſaid, that there is leſs difficulty in conceiving infinite ſpace, and infinite time, than in conceiving the final boundaries of ſpace, or the beginning or end of time.

SECTION II.

Of the Improvement of Memory.

As Memory is the principal inſtrument, by which all human knowledge is retained and brought into uſe, much attention has naturally been beſtowed on the ſtate in which this faculty exiſts in different individuals, and on the beſt means of improving it. In nothing, perhaps, do individuals differ more from each other, than in the extent and accuracy of Memory. One man readily imbibes the knowledge that is imparted to him, although, perhaps, he does not long retain it, or cannot accurately communicate it again. Another acquires information ſlowly, and with difficulty, although, when once he makes the acquiſition, it does not afterwards eaſily eſcape him; while a third, perhaps, has the good fortune to poſſeſs a memory, at once ſuſceptible, retentive, and ready.

A prejudice has, indeed, not uncommonly prevailed, that a great memory is ſcarcely compatible with that acuteneſs of parts denominated Genius; inſomuch, that no one bluſhes at acknowledging a ſhortneſs of memory, while, to be accuſed of a defect of judgment, or a want of penetration, is uſually conſidered as a high affront. This prejudice, however, appears to be entirely without foundation; and memory, far from being incompatible with genius, ſeems even to be neceſſary, in its utmoſt perfection, for thoſe happy exertions of intellect which confer immortality upon their authors. A great memory may, indeed, exiſt, without giving birth to genius, and is not unfrequently found in perſons little removed from the ſtate of idiocy; which circumſtance may have given riſe to the prejudice in queſtion. But if we look around us, at thoſe individuals who have acquired eminence as men of genius, or examine into the endowments of thoſe who have formerly been famed for their intellectual exertions, we ſhall uniformly find, that a retentive and capacious memory formed the baſis upon which their literary fame was reared,

This truth has been amply and ſatisfactorily illuſtrated by Mr Stewart, (Elem. &c. c. 6, § 8.), to whoſe obſervations I ſhall therefore refer. One more example modern times has enabled us to add, of the connexion between genius and great memory, which it may not be improper to mention. It is of that completely ſelf-taught genius, and pleaſing poet, Mr Robert Bloomfield, of whom it is authentically recorded, that he compoſed the latter part of the Autumn, and the whole of the Winter of his 'Farmer's Boy,' mentally, without ever putting pen to paper. Nor was this all; for he even completely corrected and reviſed this extenſive portion of his poem, before he ever wrote a word of it, and this, too, while at work with his fellow journeymen in a garret; and then, as he himſelf expreſſed it, when it was thus prepared, he had nothing to do but to write it down.

Such exertions of memory are truly wonderful; and, in fact, exertions of this faculty, which are much more ordinary, are ſufficient to call forth our higheſt admiration. 'Of a 'human memory,' ſays Dr Beattie, (Eſſay on Mem.) 'improved to no extraordinary pitch, 'how vaſt is the comprehenſion! With what 'an endleſs multitude of thoughts is it ſupplied, 'by reflection, reading, and converſation, and 'by a diverſified experience! Things natu-'ral; as animals, vegetables, minerals, foſſils; 'mountains and vallies; land and water; 'earth and heaven; the ſun, moon, and ſtars, 'with their ſeveral appearances, motions, and 'periods; the atmoſphere and meteors, with 'all the viciſſitudes of weather; things artifi-'cial, as towns, ſtreets, houſes, highways, and 'machines, with their various appendages;—'abſtract notions with regard to truth and 'falſehood, beauty and deformity, virtue and 'vice; proportions in quantity and number; 'religion, commerce, and policy, whereof the 'brutes know nothing, and which are the 'chief materials of human converſation:—'Theſe are ſome of the general heads under 'which may be arranged the manifold trea-'ſures of human memory: and under each of 'theſe heads, what an infinity of individual

‘ things are comprehended!’—‘ How numer‘ ous,’ adds he afterwards, ‘ are the words ‘ even of one language! He who is maſter ‘ of four, muſt be ſuppoſed to retain two hun‘ dred thouſand words, at leaſt, with all the ‘ different ways of applying them according ‘ to rule, and innumerable paſſages in books ‘ to illuſtrate their meaning. And that four ‘ languages do not exceed the capacity of an ‘ ordinary man, will not be denied by thoſe ‘ who believe with Pliny and Quintilian, that ‘ Mithridates underſtood two and twenty.’

The cultivation of ſo noble a faculty as the Memory, is ſurely then a matter of the higheſt importance; and it is not to be wondered, that ſo much inveſtigation has been beſtowed upon the ſubject. At the ſame time, we muſt not expect that any cultivation, however aſſiduous, will completely ſupply the natural deficiencies of Memory, any more than thoſe of Judgment, Taſte, or any other faculty. The utmoſt that can be expected from any exertion of our own, is to direct the Memory to its proper objects, and in that order and ſucceſſion which will moſt facilitate its operation; to remove, as much as may be, thoſe obſtructions which are calculated to retard the due action of the faculty; and, by a repeated and ſedulous exertion, to bring it to that degree of maturity and energy, which exerciſe ſo highly promotes in every human attainment.

In the preceding Section it has been ſtated, that the due exerciſe of Memory depends chiefly upon what is called attention, and the aſſociation of ideas; whence we may conclude, that in order ſucceſsfully to cultivate the Memory, we muſt cultivate thoſe ſubordinate efforts of the mind. It is matter of the moſt familiar obſervation, that we muſt be attentive to any thing which we wiſh afterwards to remember; that is, we muſt diligently exert that peculiar faculty of which it is an object, whether it be Perception, Senſation, Conſciouſneſs, Abſtraction, or any other. In this exerciſe of attention, a due exertion of the faculty of Conception, which, as already obſerved, forms an ingredient in almoſt every mental operation, is of the greateſt conſeqence. Whatever is diſtinctly conceived or underſtood, will in general be afterwards recollected; while vaguely formed or indefinite notions will leave no permanent traces upon the mind. When we read, therefore, let us labour to underſtand, clearly and preciſely, our author's meaning; let us compare what goes before, with what follows in his work; let us ſearch for the characteriſtic features of his ſyſtem, and compare his opinions with thoſe of other authors who have treated of the ſame ſubject. By this means, not only the faculty of conception, but the reaſoning powers, will be uſefully exerciſed; and the beſt proviſion will be made for a diſtinct recollection.

It has been much diſputed, whether it be an uſeful exerciſe to write down thoſe things which we are deſirous to remember; but there can be little doubt, that in ſome caſes this may be exceedingly proper; in others not ſo. To write a great deal, cannot be highly uſeful to Memory; for the attention is but too apt to be diverted from the matter itſelf, to the mere manual operation: but it is ſurely uſeful to tranſcribe certain ſhort paſſages which we ſelect, on account of the importance or curioſity of the matters which they contain, and to which we, by this means, can afterwards conveniently refer. It would likewiſe, no doubt, be a very uſeful exerciſe to write a ſhort abridgement and character of any important treatiſe we have read; or at leaſt to ſtate the leading tenets of the work, and our opinion of its merits, in a few ſhort paragraphs. We ſhould thus form a ſort of regiſter of our ſtudies, to which we might afterwards refer with the greateſt advantage.

This laſt exerciſe is evidently ſubſervient to the faculty of Aſſociation, as well as to Attention; and, whatever aids that important principle of our nature, is in the higheſt degree conducive to Memory. Moſt of the above remarks have indeed a tendency to promote the exerciſe of Aſſociation, as well as of Attention. Thus, when we compare together the different parts of an author's work, ſo as to form out of it one conſiſtent whole, we provide that, by means of the aſſociating principle, the recollection of one part ſhall ſuggeſt to us the complete ſyſtem. If, again, we compare the opinions of one writer with thoſe of another who has treated of the ſame ſubject, we ſhall digeſt the whole into one ſyſtem, by which the principle of Aſſociation will be ſtill farther promoted. This ſyſtematic arrangement of the principles of any branch of knowledge, will be found to be attended with the greateſt advantage; and if ſome ſuch general ſyſtem of principles is not formed, reading will furniſh nothing,

thing but a deſultory collection of ideas, ſcarcely applicable to any uſeful purpoſe.

It has been remarked, that in thoſe branches of knowledge which have not yet been formed into a real philoſophical ſyſtem, which is perhaps the caſe with Medicine, Phyſiology, Chemiſtry, and ſome others, it is better to adopt a merely hypothetical ſyſtem, for the purpoſe of reference and arrangement, than to be deſtitute of all ſyſtem. In ſuch a caſe, however, we muſt be careful to recollect, that our ſyſtem is but an hypotheſis, leſt it ſhould uſurp in our minds the place of legitimate theory. In the ſtudy of hiſtory, ſhort abridgments anſwer the end of ſyſtems, by forming a general chart, to which the more minute details may be referred; and an abridgement of univerſal hiſtory enables us to aſcertain the relative importance of thoſe particular hiſtories to which our attention has been directed, and their mutual connexion one with another. Some ſuch general chart of ſcience would be of the greateſt importance to the aſſiduous ſtudent, by giving him clearer views of the relative value of the particular branch to which he has devoted himſelf, and its connexion with the other branches of human knowledge.

With reſpect to the mechanical expedients which have been propoſed for aiding the memory, it does not appear that much real advantage is to be expected from them. Of theſe the moſt celebrated is the *loci*, or topical memory of the ancient rhetoricians, of which ſome account is delivered in the writings of Cicero and Quintilian. The intention of this expedient was to facilitate the recollection of the various heads of an oration, by aſſociating them in the mind with the different apartments of a houſe, or the various houſes in a ſtreet, the preciſe ſucceſſion of which had been previouſly rendered familiar to the mind. The ſubordinate parts of the diſcourſe were to be aſſociated with the furniture of the rooms, or the ſubdiviſions of the houſes; and thus the whole oration was to be ſuggeſted to the memory, with very little effort.

This mechanical contrivance is no doubt founded in nature; for, as Quintilian obſerves, 'when we reviſit any place after a lapſe of 'time, we not only recognize the ſcene, but 'we are led to recollect all that paſſed in it 'when we were there before.'* Mr Stewart, too, ſpeaks of a young woman, in a very low rank of life, who contrived a method of committing to memory the ſermons which ſhe was accuſtomed to hear, by fixing her attention, during the different heads of the diſcourſe, on

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* Cum in loca aliqua poſt tempus reverſi ſumus, non ipſa agnoſcimus tantum, ſed etiam quæ in his fecerimus, reminiſcimur, perſonæque ſubeunt, nonnunquam tacitæ quoque cogitationes in mentem revertuntur.—*Quint. Inſt. Orator. l.* 11. *c.* 2.

different compartments of the roof of the church, in ſuch a manner, as that when ſhe afterwards ſaw the roof, or recollected the order in which its departments were diſpoſed, ſhe recollected the method which the preacher had obſerved in treating his ſubject. (Elem. &c. c. 6. § 6.) Yet, after all, it may fairly be queſtioned, whether, in the caſe of an oration, it would not prove more laborious permanently to aſſociate the various heads of diſcourſe with the different apartments of a houſe, than at once to fix in the memory the natural ſucceſſion of the heads themſelves. Quintilian, indeed, candidly acknowledges, that he never received any benefit from this artificial kind of memory, which has now fallen entirely into diſuſe. In alluſion to it, however, the heads of a diſcourſe are ſtill called *topics*, and we continue to ſay *in the first place*, *in the second place*, &c.

An artificial help to the memory, which is certainly more uſeful, is the employment of memorial lines, or verſes, in which, by the ſubſtitution of the letters of the alphabet for the numeral characters, we can eaſily commit to memory certain dates, meaſures, computations, &c. This is called the *Ars Lulliana*, on account of the attention which the famous Lully beſtowed upon it; and an ample collection of ſuch memorial verſes, is to be found in a ſmall volume by Gray, called *Memoria Technica*. The merit of this art conſiſts in ſubſtituting words which are eaſily remembered, inſtead of numbers, which it is very difficult to remember. But neither it, nor any other mechanical expedient, affords any real cultivation to the faculty of Memory. This object, it would ſeem, can be accompliſhed only by cultivating thoſe exertions of the mind on which the faculty of Memory depends, *viz.* Attention, and the Aſſociation of Ideas.

CHAPTER EIGHTH.

Of Reason.

SECTION I.

Analysis of the Faculty.

THAT man is endowed with Reaſon, a faculty by which he is enabled to examine and appreciate the various objects of his obſervation, and even to aſcend to the knowledge of the Firſt Cauſe of all created beings, has naturally furniſhed the ſubject of his exultation; and the title of 'rational animal,' by which he chooſes to diſtinguiſh himſelf, forms at once an honourable and a preciſe mark of diſcrimination between him and the lower animals. It is therefore an object of the higheſt intereſt, as well as importance, to examine into the nature of this faculty, and to aſcertain the principles by which it is regulated; an object which not only forms the primary purpoſe of all the treatiſes of Logic, but even of thoſe treatiſes which take a more enlarged view of the various faculties of the human mind.

A diſtinction has very generally prevailed among the writers on Intellectual philoſophy, according to which the power of Reaſon is repreſented as conſtituted by two diſtinct faculties, one of which is called Judgment, the other Reaſoning. This diſtinction ſeems to have originated with the ancient Logicians, to whoſe ſyſtem it was very conveniently adapted; for, according to this ſyſtem, the natural progreſs of knowledge was repreſented to be, Firſt, the formation of ideas, or ſimple notions, unaccompanied by belief, which was the province of Simple Apprehenſion, *i. e.* Perception, or Conception: Secondly, the comparing theſe ſimple notions together, and the expreſſing a belief, or opinion, concerning them, which was the province of Judgment, and is always expreſſed by a propoſition: And, Thirdly, the comparing together our various judgments, and deducing concluſions from them, which was repreſented to be the province of Reaſoning. Thus, ſays Dr Watts, ‘ As the ‘ firſt work of the mind is Perception, where- ‘ by our ideas are framed, and the ſecond is ‘ judgment, which joins or disjoins our ideas, ‘ and forms a propoſition; ſo, the third ope- ‘ ration of the mind is Reaſoning, which joins ‘ ſeveral propoſitions together, and makes a ‘ ſyllogiſm; that is, an argument whereby we ‘ are wont to infer ſomething that is leſs known, ‘ from truths that are more evident.’ (Logic, Part 3. at the beginning.)

But this diſtinction of the rational faculty, into ſinto Judgment and Reaſoning, has been by no means confined to the Logicians, whoſe purpoſe it ſo manifeſtly anſwered, but has been followed by moſt of the ſubſequent writers on the intellectual powers of man. Dr Reid, like Locke, treats ſeparately of the two faculties, and preciſely ſtates that there is a diſtinction between them.* Having adopted the logical definition of Judgment, which ſtates it to be ‘ an act of the mind, whereby one thing ‘ is affirmed or denied of another, ’ (Eſſay VI. c. 1.),

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* Locke ſeems to uſe the term Judgment in a ſenſe different from that which is uſually given to it. 'The 'mind,' ſays he, (B. IV. c. 14. § 4.) 'has two faculties 'converſant about truth and falſehood. *1ſt*, Knowledge, 'whereby it certainly perceives, and is undoubtedly ſatiſ'fied of the agreement or diſagreement of any ideas. '*2dly*, Judgment, which is the putting ideas together, or 'ſeparating them from one another, in the mind, when 'their certain agreement or diſagreement is not perceiv'ed, but preſumed to be ſo.' The term Judgment, in its philoſophical ſenſe, is, doubtleſs, more uſually applied to the firſt of theſe acts of the mind, than to the ſecond. The term *Reaſoning*, however, or *Reaſon*, is uſed by Mr Locke in its ordinary acceptation. 'The greateſt part of 'our

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‘ our knowledge, ’ ſays he, (B. IV. c. 17. § 2.), ‘ depends upon deductions and intermediate ideas; and in ‘ thoſe caſes, where we are fain to ſubſtitute aſſent inſtead of knowledge, and take propoſitions for true, ‘ without being certain they are ſo, we have need to find ‘ out, examine, and compare the grounds of their probability. In both theſe caſes, the faculty which finds ‘ out the means, and rightly applies them to diſcover ‘ certainty in the one, and probability in the other, is ‘ that which we call Reaſon.’ In the ſame Chapter, (Sect. 17.), he thus defines the boundaries of theſe three ſpecies of knowledge. ‘ *Intuitive* knowledge, ’ ſays he, ‘ is the perception of the certain agreement or diſagreement of two ideas, immediately compared together. ‘ *Rational* knowledge is the perception of the certain ‘ agreement or diſagreement of any two ideas, by the ‘ intervention of one or more other ideas. *Judgment* is ‘ the thinking or taking two ideas to agree or diſagree, by ‘ the intervention of one or more ideas, whoſe certain ‘ agreement, or diſagreement, with them, it does not perceive, but hath obſerved to be frequent and uſual,’

c. 1.), he ſays, (Eſſay VII. c. 1.), ‘ There is a ‘ diſtinction between Reaſoning and Judging. ‘ Reaſoning is the proceſs by which we paſs ‘ from one judgement to another which is the ‘ conſequence of it. Accordingly, our judge‑ ‘ ments are diſtinguiſhed into intuitive, which ‘ are not grounded upon any preceding judge‑ ‘ ment; and diſcurſive, which are deduced ‘ from ſome preceding judgment, by reaſon‑ ‘ ing. In all reaſoning, therefore, there muſt ‘ be a propoſition inferred, and one or more ‘ from which it is inferred. And this power ‘ of inferring, or drawing a concluſion, is only ‘ another name for Reaſoning; the propoſition ‘ inferred being called the *concluſion*, and the ‘ propoſition, or propoſitions, from which it is ‘ inferred, the *premiſes*.’

Dr Reid, however, is candid enough to acknowledge, that the limits between Judgment and Reaſoning are not very preciſely ſettled. ‘ A proceſs,’ ſays he (as above), ‘ conſiſting

‘ of many ſteps, is ſo eaſily diſtinguiſhed from ‘ Judgment, that it is never called by that ‘ name. But, when there is only a ſingle ſtep ‘ to the concluſion, the diſtinction is leſs obvi‘ous; and the proceſs is ſometimes called ‘ Judgment, ſometimes Reaſoning.’ And he adds afterwards, ‘ we are taught in Logic, that ‘ Judgment is expreſſed by one propoſition, ‘ but that Reaſoning requires two or three. ‘ But ſo various are the modes of ſpeech, that ‘ what in one mode is expreſſed by two or ‘ three propoſitions, may, in another mode, be ‘ expreſſed by one. Thus, I may ſay, “ *God* “ *is good, therefore good men ſhall be happy.*” ‘ This is reaſoning of that kind which logici‘ans call an *enthymeme*, conſiſting of an ante‘cedent propoſition, and a concluſion drawn ‘ from it. But this reaſoning may be expreſſ‘ed by one propoſition, thus: “ *Becauſe God* “ *is good, good men ſhall be happy.*” This is ‘ what they call a cauſal propoſition, and ‘ therefore expreſſes Judgment; yet the en 'thymeme, which is Reaſoning, expreſſes no 'more.'

I am inclined to infer from theſe conſiderations, as well as from the illuſtrations which are to follow, that the diſtinction which has been made between Judgment and Reaſoning, is not founded in any natural diverſity of the nature or objects of the faculties; and has no other foundation than the various manner in which the ſame faculty is occaſionally applied. When the truth which is aſſerted, or the falſity which is denied, are perfectly obvious, and require little or no examination, the faculty is then commonly called Judgment; but, when they are more remote from common apprehenſion, and require a careful inveſtigation, it has then been dignified with the name of Reaſoning. In fact, in the very definition which the logicians give of Judgment, it is allowed that two things or ideas are compared together, *viz.* the ſubject and predicate of the propoſition expreſſed;

preſſed; and, in a proceſs of Reaſoning, each ſtep conſiſts of nothing more than a like comparison of the agreement or diſagreement of the propoſitions which immediately follow one another.

This will be rendered ſtill more apparent, if we take for an example any clear and indiſputable proceſs of reaſoning, and examine what is the evidence by which we are led to infer one ſtep from the immediately preceding one; or the concluſion from the general premiſes; when it will appear that this is accompliſhed ſolely by the application of ſome ſelf-evident truth, or neceſſary firſt principle, *i. e.* by the intervention of what is called Judgment alone. Thus, in the firſt propoſition of Euclid's Elements, in which two circles are deſcribed having a common radius, we infer, that the radii of the one circle are all equal to thoſe of the other, becauſe each of them, according to the definition of a circle, muſt be equal to this one common radius. What then, I aſk, is the principle which leads us to make this inference? Euclid will inform us that it is the ſelf-evident truth or axiom, that, when two magnitudes are ſeverally equal to ſome third magnitude, they muſt be equal to one another. But this truth is among thoſe which are allowed to be known by the faculty of Judgment; ſo that, in this inſtance, the proceſs of reaſoning is nothing more than a particular application of an intuitive judgment; nor would it be difficult to extend the illuſtration to a variety of examples.

If this account of the matter be juſt, it would ſeem adviſeable to lay aſide the diſtinction between Judgment and Reaſoning, as void of any natural foundation; and to ſubſtitute, in the room of both, the term Reaſon, which has been indiſcriminately uſed for either. It is not, however, ſo eaſy to ſay what is the preciſe office of this noble faculty, or accurately to aſcertain what are the peculiar objects on which it is properly exerciſed. From what has been juſt ſtated, it ſeems natural to infer, that the objects of reaſon are no other than thoſe ſelf-evident truths or axioms, to which we find ourſelves compelled to aſſent by a kind of neceſſity, inſomuch, that we cannot conceive that their oppoſites ſhould be true. Admitting this to be the caſe, Reaſon may be defined, that faculty by which we are made acquainted with abſtract, or neceſſary truth; but this definition I propoſe with much diffidence, as it is not ſupported by the concurrence of any authority.

Dr Reid has aſſigned a much more extenſive range than what is here allotted to our rational powers; for, having diſcarded Mr Locke's account of Judgment, which aſſigns for its office, the aſcertainment of the agreement or diſagreement of our ideas, he adopts in its ſtead the older definition of the Logicians, *viz.* that Judgment is an act of the mind, whereby one thing is affirmed or denied of another. (Eſſay VI. on the Intellectual Powers, c. 1.) It follows from this, that every kind of belief, whether accompanying the contemplation of abſtract truth, or following the operation of the faculties of Perception, Memory, Conſciouſneſs, &c. is the conſequence of Judgment alone. Accordingly, this doctrine is diſtinctly ſtated by Dr Reid, who ſays, (*ut ſupra*,) 'In perſons come to years of underſtanding, Judgement neceſſarily accompanies all ſenſation; perceptions by the ſenſes, conſciouſneſs and memory, but not conception.' And he adds afterwards, 'It is evident, that a man who feels pain, judges and believes that he is really pained. The man who perceives an object, believes that it exiſts, and is what he diſtinctly perceives it to be; nor is it in his power to avoid ſuch judgment. And the like may be ſaid of Memory and of Conſciouſneſs. It is certain, that all of them are accompanied with a determination that ſome-

'thing is true or falſe, and a conſequent 'belief. If this determination be not Judgement, it is an operation that has got no 'name; for it is not ſimple Apprehenſion, 'neither is it Reaſoning; it is a mental affirmation or negation; it may be expreſſed by 'a propoſition affirmative or negative, and it 'is accompanied with the firmeſt belief. Theſe 'are the characteriſtics of Judgment; and I 'muſt call it Judgment till I can find another 'name to it.'

I confeſs I am unable to reconcile this doctrine, with what Dr Reid had previouſly laid down concerning the evidence of the ſenſes, of memory, &c. to which I implicitly ſubſcribe. 'It appears, therefore,' ſays he, (Eſſay II. c. 5.) 'that the clear and diſtinct 'teſtimony of our ſenſes carries irreſiſtible 'conviction along with it, to every man in 'his right judgment. That this conviction is 'not only irreſiſtible, but it is immediate. We 'aſk no argument for the exiſtence of the 'object, but that we perceive it; Perception 'commands our belief upon its own authority, 'and diſdains to reſt its authority upon any 'reaſoning whatever.' Again, when ſpeaking of Memory in the following Eſſay, (c. 1.) he obſerves, 'Memory is always accompanied 'with the belief of that which we remember, 'as Perception is accompanied with the belief 'of that which we perceive, and Conſciouſneſs 'with the belief of that whereof we are con'ſcious.' 'I find in my mind,' adds he, (c. 2.) 'a diſtinct conception and a firm belief 'of a ſeries of paſt events; but how this is 'produced, I know not. I call it Memory, 'but this is only giving a name to it; it is not 'an account of its cauſe. I believe moſt firm'ly what I diſtinctly remember; but I can 'give no reaſon of this belief. It is the in'ſpiration of the Almighty that gives me this 'underſtanding.'

The concluſion to which theſe obſervations appear to me to lead is, that the evidence of Senſe, and the evidence of Memory, as well as that of Conſciouſneſs, are, each of them, completely independent ſources of Belief, which cannot be reſolved either into one another, or into any common principle; and to this concluſion I willingly ſubſcribe my aſſent. But this concluſion appears to me utterly irreconcileable with the doctrine which reſolves the belief accompanying theſe operations, and, indeed, all belief whatever, into an exerciſe of Judgment. Inſtead of this I ſhould be inclined to ſay, that, in like manner as the belief derived from the ſenſes, that from Memory, and that from Conſciouſneſs, are all independent of each other, and are inherent in the very faculties themſelves; ſo does the faculty of Judgement, or rather Reaſon, produce an implicit belief of the reality of thoſe diſtinctions which it points out, and of thoſe truths which it immediately recognizes; which belief is of peculiar kind, and cannot be reſolved into any other ſpecies, although it demands our aſſent with equal force.

The objects of Reaſon, then, are thoſe general truths, which have uſually been called neceſſary; by which is meant, that we not only believe them to be true, and their oppoſites to be falſe, but that we believe their oppoſites to be impoſſible, and in their very nature ſelf-contradictory. The cauſe of this belief and conviction I am unable to reſolve into any thing elſe than the original conſtitution of our nature, by which it is decreed that we cannot refuſe our aſſent to thoſe truths which are the proper objects of reaſon, without the conſciouſneſs of acting abſurdly and inconſiſtently. In like manner, the belief which accompanies Perception, Memory, and Conſciouſneſs, cannot be reſolved into any thing elſe than the original conſtitution of our nature; and it impreſſes us with the conviction of equal certainty, as that

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which is inherent in Reaſon. But we do not call the truths which are aſcertained by theſe firſt mentioned faculties neceſſary truths, becauſe we conceive their oppoſites to be poſſible, although we believe them to be falſe. Both kinds of truths, however, are called intuitive, or ſelf-evident, becauſe they are admitted, immediately, and upon their own proper evidence alone; and this laſt mentioned claſs of truths are called Contingent, to diſtinguiſh them from the neceſſary truths which are the objects of Reaſon.

Philoſophers, in general, have been much more diſpoſed to admit the evidence of Reaſon, than that of the various claſſes of contingent truths; and have too frequently attempted to undermine the latter by means of the former. Thus, Deſcartes, as we have repeatedly had occaſion to remark, rejected all contingent evidence, except the evidence of Conſciouſneſs; and moſt metaphyſicians, both ancient and modern, have deemed the teſtimony of the ſenſes very queſtionable. But the ſceptical ſect of philoſophers, as is well known, have carried diſbelief ſo far as to reject the evidence of Reaſon itſelf, and have aſſerted, that there was no ſufficient cauſe for believing one thing more than another. Mr Hume is doubtleſs the moſt ingenious defender of this wonderful paradox; for a paradox it ſurely is, of the moſt extraordinary kind, to attempt to prove, by a laboured proceſs of reaſoning, that there is no evidence whatever in reaſoning itſelf.

The argument of Mr Hume amounts principally to this, that Judgment and Reaſoning reſolve themſelves into Conception, or the mere formation of arbitrary and fanciful ideas. To make the matter very clear, he tells us, (Treatiſe of Human Nature, Vol. I. p. 172.) that an opinion or belief may moſt accurately be defined, ' a lively idea, related to, or aſſo- ' ciated with a preſent impreſſion.' By ſuch unintelligible explanations, and ſelf-contradictory aſſertions, has he attempted to ſubvert the evidence of the faculty of Reaſon, that invaluable prerogative of man.

Scepticiſm, it has been obſerved, takes its origin from a complete miſapprehenſion of the nature of reaſoning; which, of neceſſity, muſt reſt upon ſomething that is taken for granted, or admitted, upon its own proper evidence, forming what is called a firſt principle. To aſcertain, therefore, what truths are deſervedly entitled to be ranked as firſt principles, or are to be admitted intuitively, is evidently an inquiry of the higheſt importance; to which, as naturally offering itſelf for conſideration in this place, we ſhall turn our attention in the next Section.

SECTION II.

Of First Principles; or Intuitive Truths.

THE acute genius of Ariſtotle ſeems to have formed very juſt notions of the nature of firſt principles, and the neceſſity of grounding every ſcientific inveſtigation upon them. In the ſecond book of his Analytics, we have what may be called a treatiſe upon firſt principles; and it is the oldeſt upon the ſubject of which we are poſſeſſed. Among other valuable remarks, Ariſtotle ſays, (Analyt. l. 2. c. 16.) 'Except ſome firſt principles be taken for 'granted, there can be neither reaſon nor 'reaſoning. It is impoſſible that every truth 'ſhould admit of proof, otherwiſe proof would 'extend *in infinitum*, which is altogether in'compatible with its nature; and if ever men 'attempt to prove a firſt principle, it is becauſe 'they are ignorant of the nature of proof.'

Ariſtotle, however, has attempted no enumeration of firſt principles; and although he appears to have formed ſo very juſt notions of their general nature, yet it is manifeſt, from the tenor of the Peripatetic philoſophy, that he aſſumed many things as firſt principles, which, not only have no claim to be conſidered as ſelf-evident, but which we now certainly know to be falſe. Such were the aſſumptions, that the earth is at reſt, that the heavenly bodies move in circles, that nature abhors a vacuum, that all bodies are compoſed of matter and form, and a variety of others.

Deſcartes was the firſt that ſucceſsfully expoſed the fallacy of the Ariſtotelian philoſophy, at leaſt in ſo far as regards Metaphyſics; and appears to have been fully aware of the erroneous concluſions to which ſo many gratuitous aſſumptions

tions muſt lead. While, however, he rejected the numerous hypotheſes of Ariſtotle, he went into an oppoſite error, no leſs dangerous to ſound philoſophy, by narrowing too much the baſis of firſt principles, or truths which muſt be admitted on their own proper evidence. In the philoſophy of mind, he expreſsly admits but one firſt principle, the conſciouſneſs of our exiſtence; and he attempts to deduce all natural phenomena from the combined influence of matter and motion alone. To this circumſtance may fairly be aſcribed all the falſe philoſophy of Berkeley, Hume, and the modern ſceptics.

To miſtakes in firſt principles, then, appears to be due much of the ſophiſtry that has ſo long perplexed the world. The firſt perſon who ſeems to have been ſufficiently aware of this truth, was the well-known Father Buffier, whoſe, 'Traité des Premiers Vérités, et de la 'Source de nos Jugemens,' appeared about the year 1724, and forms the firſt expreſs treatiſe upon firſt principles ſince the time of Ariſtotle. The opinion given of this work, by a very competent judge (Dr Reid), is in the higheſt degree favourable. 'I think,' ſays he (Eſſay 6. on the Intellectual Powers, c. 7.) 'there is more which I take to be original in 'this Treatiſe, than in moſt books of the me'taphyſical kind I have met with; that many 'of his notions are ſolid; and that others, 'which I cannot altogether approve, are inge'nious.'

The work, indeed, appears to be juſtly entitled to this high encomium; for it is characterized throughout by an uncommon portion of good ſenſe, and a perfect freedom from attachment to any philoſophical hypotheſis or ſyſtem. In the courſe of Buffier's inquiries, the moſt celebrated controverſies in philoſophy come incidentally to be touched upon; ſuch as the ſpirituality of the human ſoul, the queſtion

tion of moral liberty and neceſſity, the abſtract attributes of time and ſpace, property and accident, identity, eſſence, &c.; and even the celebrated ideal theory; and, upon all theſe difficult queſtions, the obſervations of this author are in the higheſt degree rational and ſatisfactory.

With reſpect to his more immediate ſubject, the firſt principles of knowledge, it may be ſaid, that Buffier has been more ſucceſsful in pointing out the neceſſity of admitting a variety of ſuch upon their own proper evidence, than in the particular enumeration and claſſification which he has left us. The two great ſources from which he derives his firſt principles, are the conſciouſneſs we have of our own thoughts, and common ſenſe *; which laſt ſource, he ſays, is ſcarcely mentioned by philoſophers; but which he employs in the common acceptation of the phraſe, as denoting the faculty by

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* ‘Sens commun.’

by which men form judgments on the ordinary objects of their experience, which are not properly ſubjects of Conſciouſneſs. 'If,' ſays he, 'the advocates for *innate ideas* underſtand, 'by that term, what I mean by *common ſenſe*, 'I ſhall not cavil about words; and as they 'cannot avoid coinciding with me, and admitting common ſenſe for the firſt rule of truth, 'I ſhall readily agree to admit their innate 'ideas, taking them, however, in their preciſe and true ſignification.' (Part 1. c. 5.)

In the ſame chapter, he gives the following examples of the principles of common ſenſe, though not as a complete enumeration of them.

1. There are other beings, and other men in the world beſides myſelf.

2. There is in them ſomething that is called truth, wiſdom, prudence; and this ſomething is not merely arbitrary.

3. There is in me ſomething that I call intelligence, or mind; and ſomething which is

not that intelligence, or mind, and which is named *body*; ſo that each poſſeſſes properties different from the other.

4. What is generally ſaid and thought by men in all ages and countries of the world, is true.

5. All men have not combined to deceive and impoſe upon me.

6. What is not intelligence, or mind, cannot produce all the effects of intelligence, or mind; neither can a fortuitous jumble of particles of matter form a work of ſuch order, and ſo regular motion, as a watch.

In chapter 7th, Buffier mentions three qualities, or teſts, by which firſt truths, or maxims, of common ſenſe, may be diſtinguiſhed from all others. 1ſt, They are ſo clear, that they cannot be proved by any thing clearer: 2d, They have been admitted in all countries, and at all times, with exceedingly few exceptions: and, 3d, They are ſo ſtrongly imprinted in our minds, that we regulate our conduct by them in ſpite of all the ſpeculative refinements of that philoſophy which denies them. In carrying on his inquiries, he ſeems to conſider the general conſent of mankind as affording the ſureſt teſt, by which firſt truths are made known; and, although aware of the objection which the generally prevailing prejudices, and falſe opinions, which have been found among men, furniſh to this doctrine, he is not altogether ſucceſsful in obviating its force. He has likewiſe fallen into the common error of his time, by conſidering the teſtimony of the ſenſes, as at beſt affording but probable evidence, and by no means entitled to be ranked on the footing of certain and intuitive truth. The evidence of memory he likewiſe places on the ſame level as the evidence of ſenſe. (See part 1. c. 14. 15. &c. and 20.)

The important ſcience of firſt truths thus ſucceſsfully commenced by Buffier, ſeems for

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a while to have attracted little notice; and the career of ſcepticiſm was by no means impeded by the able arguments which the learned father had oppoſed to it. The writings of Mr Hume brought the ſceptical ſyſtem to its finiſhed ſtate, and propoſed a ſet of doctrines ſo completely repugnant to common ſenſe, that, as was naturally to be expected, men began again to ſeek for the foundations of a rational belief, and to endeavour to aſcertain what the firſt principles of knowledge really were. Dr Reid was undoubtedly among the firſt, as well as the moſt eminent, in conducting this important inquiry; and was led to it, as he himſelf candidly confeſſes, by the repugnance he felt at admitting the obnoxious tenets of Mr Hume.

In the dedication to his Inquiry into the Human Mind, (firſt publiſhed in 1764) this philoſopher informs us, that he never thought of calling in queſtion the received principles with regard to the human underſtanding, until

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the Treatiſe of Human Nature was publiſhed in the year 1739. To this he was led, by his reluctance to admit the ſceptical doctrine; being firmly perſuaded, he ſays, 'that abſolute 'ſcepticiſm is not more deſtructive of the faith 'of a Chriſtian, than of the ſcience of a philoſopher, and of the prudence of a man of 'common underſtanding.' In this, his firſt publication upon Intellectual Philoſophy, he fully inveſtigates thoſe mental operations which depend upon the five ſenſes, and attacks ſcepticiſm in its ſtrongeſt hold, by eſtabliſhing the authority of the ſenſes as deciſive in their own proper province, and affording principles of belief as certain as any which we poſſeſs. In this ſpeculation, Dr Reid was completely original, as no philoſopher before him had conſidered the evidence of ſenſe as any thing more than probable at beſt; but this being once eſtabliſhed as an intuitive truth, or firſt principle, the certainty of the evidence of memory, conſciouſneſs, and others of our faculties, eaſily followed;

lowed; and nothing remained but to arrange and methodise the various ſpecies of intuitive truths, or certain and independent ſources of belief.

The eſſay on the Immutability of Truth, publiſhed by Dr Beattie in 1770, ſucceſsfully followed up the blow which Dr Reid had levelled againſt the ſceptical ſyſtem. It gives a more detailed examination to the obnoxious tenets of Hume, as well as of Berkeley and the other ſceptical writers; and contains many important obſervations on the nature of evidence, the rational grounds of belief, and the different ſpecies of truths. In this work the author propoſes the following enumeration of the various kinds of evidence, or ſources of belief. 1. Mathematical evidence. 2. The evidence of external ſenſe. 3. The evidence of conſciouſneſs. 4. The evidence of memory. 5. That evidence which we have, when, from effects, we infer cauſes. 6. Probable evidence;

and,

and, 7. The evidence of teſtimony. The firſt five, he ſtates to be *certain* intuitive truths, or maxims of common ſenſe. The remaining two he likewiſe conſiders as intuitive truths, or maxims of common ſenſe, but which we hold only to be probable, and not certain; and he divides the 6th claſs into two ſpecies, 1ſt, The evidence by which we judge of future events by our paſt experience of ſimilar events; and, 2d, The evidence of analogy. (See Eſſay on the Immutability of Truth, Part I. c. 2.)

The work of Dr Campbell on the Philoſophy of Rhetoric, publiſhed in 1776, proceeded from the ſame ſchool which had given birth to the writings of Reid and Beattie; and among all theſe authors there exiſted, not only a ſimilarity of ſentiments, but the greateſt mutual cordiality. To this circumſtance we may aſcribe the chapter which Dr Campbell has introduced, ' of the different ſources of evi-' dence, and the different ſubjects to which 'they are reſpectively adapted,' (Vol. I. b. 1. c. 5.); and which he himſelf acknowledges not to be very intimately connected with his ſubject. Dr Campbell divides all evidence into two kinds; Intuitive, which is admitted immediately, on a bare attention to the ideas under review; and Deductive, which is admitted mediately, by a compariſon of theſe with other ideas. Intuitive evidence he arranges under three heads, 1. Mathematical axioms, which he ſtates to be the reſult of pure *Intellection*: 2. Conſciouſneſs: and, 3. Common Senſe; under which laſt he ſeems to comprehend, both the evidence of Senſe and that of Memory, as he gives the following ſpecimen of the truths which we derive from this ſource: 'Whatever has a 'beginning, has a cauſe. When there is in 'the effect a manifeſt adjuſtment of the ſeve'ral parts to a certain end, there is intelligence 'in the cauſe. The courſe of nature will be 'the ſame to-morrow that it is to-day; or, the 'future will reſemble the paſt. *There is such*

‘ *a thing as body*; or, *there are material ſub-*
‘ *ſtances, independent of the mind's conceptions.*
‘ There are other intelligent beings in the
‘ univerſe beſides me. *The clear repreſenta-*
‘ *tions of my memory, in regard to paſt events,*
‘ *are indubitably true.*’ Deductive evidence is founded upon the intuitive; and Dr Campbell conſiders it as of two kinds; that which is founded upon the axioms of pure intellection, which he calls Scientific or Demonſtrative; and that which is founded upon the dictates of conſciouſneſs and common ſenſe, which he calls Moral or Probable Evidence, and divides it into, 1. The knowledge we derive from experience; 2. That from analogy; 3. Teſtimony; and, 4. The calculation of chances; which laſt he conſiders as a mixed kind of evidence, partly certain, and partly probable only.

The ſimilarity of theſe two arrangements is very evident; and it is likewiſe plain, that both are meant to comprehend, not only intuitive truths, which are our immediate concern, but likewiſe the evidence which is derived from a chain of proof, or proceſs of reaſoning. Without ſtopping to inquire into the merits or defects of either claſſification, we ſhall proceed to ſtate the reſult of Dr Reid's final examination of this important ſubject, as contained in his laſt production on the Intellectual Powers of Man, firſt publiſhed in 1785, after an interval of nineteen years continued reflection on the ſubject which had given birth to his Inquiry in 1764.

In the eſſay upon Judgment, Dr Reid has beſtowed a great deal of conſideration upon the ſubject of firſt principles, and devoted ſeveral chapters to their diſcuſſion. In Chapter 4. he obſerves, that, although it is contrary to the nature of a firſt principle to admit of a direct or apodictical proof, becauſe it muſt neceſſarily be taken for granted upon its own proper evidence; yet we are not deſtitute of means, by which thoſe that are juſt and ſolid may be confirmed, and thoſe that are falſe may be detected. He then proceeds to enumerate and illuſtrate theſe means, which he makes to be theſe five. 1ſt, To ſhew that a firſt principle ſtands upon the ſame footing with others which we implicitly admit. 2d, The proof *ad absurdum*, which furniſhes a very ſatisfactory way of eſtabliſhing the certainty of a firſt principle, by ſhewing the inconſiſtencies that reſult from rejecting it. 3d, Proving that the principle in queſtion has had the conſent of all ages and nations. 4th, Shewing that it has had a place in the human mind from earlieſt infancy; or, 5th, That it influences our practice in the common conduct of life, in ſpite of the refinements of ſophiſtry.

This being premiſed, Dr Reid proceeds to an enumeration of firſt principles, or intuitive truths, which he divides into two claſſes; thoſe which are neceſſary and immutable, whoſe contrary is impoſſible; and thoſe which are contingent and mutable, and which depend upon the preſent conſtitution of things. (Eſſay VI. on the Intell. Powers, c. 5.)

He begins with the conſideration of the ſecond claſs, of which he enumerates the following ſpecies, at the ſame time illuſtrating each at length. ‘ 1ſt,’ ſays he, ‘ I hold as a ‘ firſt principle, the exiſtence of every thing of ‘ which I am conſcious. 2d, That the thoughts ‘ of which I am conſcious, are the thoughts of ‘ a being which I call *myſelf*, my *mind*, my ‘ *perſon*. 3d, That thoſe things did really hap‘ pen which I diſtinctly remember. 4th, An‘ other firſt principle is, our own perſonal ‘ identity, and continued exiſtence, as far back ‘ as we remember any thing diſtinctly. 5th, ‘ Another, that thoſe things do really exiſt ‘ which we diſtinctly perceive by our ſenſes, ‘ and are what we perceive them to be. 6th, ‘ Another, that we have ſome degree of power 'over our actions, and the determinations of 'our will. 7th, Another, that the natural 'faculties by which we diſtinguiſh truth from 'error are not fallacious. 8th, That there is 'life and intelligence in our fellow-men, with 'whom we converſe. 9th, That certain fea-'tures of the countenance, ſounds of the voice, 'and geſtures of the body, indicate certain 'thoughts and diſpoſitions of mind. 10th, 'That there is a certain regard due to human 'teſtimony in matters of fact; and even to 'human authority in matters of opinion. '11th, There are many events depending up-'on the will of man, in which there is a ſelf-'evident probability, greater or leſs, according 'to circumſtances; and, 12th, That, in the 'phenomena of nature, what is to be, will 'probably be like to what has been in ſimilar 'circumſtances.'

The neceſſary firſt principles are what have generally been denominated axioms; and, of theſe, Dr Reid reckons various ſpecies, according to the ſciences to which they belong. '1ſt, 'There are grammatical axioms, ſuch as, that 'every complete ſentence muſt have a verb. '2d, Logical axioms, as that every propoſi- 'tion is either true or falſe; whatever may be 'truly affirmed of a genus, may be truly af- 'firmed of all the ſpecies, and all the indivi- 'duals belonging to that genus. 3d, Mathe- 'matical axioms, which are well known. '4th, There are axioms, he thinks, even in 'matters of taſte, by which our deciſions in 'the fine arts are regulated. 5th, There are 'likewiſe axioms in morals, which regulate 'our opinions of right and wrong. And, 6th, 'There are metaphyſical axioms, ſuch as, that 'all qualities muſt have a ſubject; whatever 'begins to exiſt, muſt have a cauſe which pro- 'duced it. And, laſtly, that deſign and intelli- 'gence in the cauſe, may be inferred, with 'certainty, from marks or ſigns of it in the 'effect.'

'effect.' (Eſſay VI. on the Intellect. Powers, c. 6.)

All theſe firſt principles of knowledge are, according to Dr Reid's ſyſtem, the dictates of what he calls Common Senſe. The following paſſage ſeems to convey the cleareſt explication of this philoſopher's ſentiments reſpecting the meaning of this term. 'We aſcribe' ſays he (Eſſay VI. on the Intellectual Powers, c. 2.) 'to reaſon, two offices or degrees. The firſt 'is, to judge of things ſelf-evident; the ſe'cond, to draw concluſions that are not ſelf'evident, from thoſe that are. The firſt of 'theſe is the province, and the ſole province 'of Common Senſe; and, therefore, it coin'cides with reaſon in its whole extent, and is 'only another name for one branch or one 'degree of reaſon. Perhaps it may be ſaid, 'Why then ſhould you give it a particular 'name, ſince it is acknowledged to be only a 'degree of reaſon? It would be a ſufficient

‘ anſwer to this, Why do you aboliſh a name ‘ which is to be found in the language of all ‘ civilized nations, and has acquired a right ‘ by preſcription ?—Every wiſe man will be ‘ apt to think, that a name, which is found in ‘ all languages, as far back as we can trace ‘ them, is not without ſome uſe. ’ *

Dr Beattie ſeems to have employed the term in the ſame acceptation, or in a yet more extenſive

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* A ſimilar account of the province of Common Senſe, is given at the concluſion of the Inquiry into the Human Mind. ‘ Such original and natural judgments,’ ſays our author, (c. 8.) ‘ are, therefore, a part of that furniture ‘ which nature hath given to the human underſtanding. ‘ They are a part of our conſtitution, and all the diſco‘ veries of our reaſon are grounded upon them. They ‘ make up what is called *the common sense of mankind*; ‘ and what is manifeſtly contrary to any of thoſe firſt ‘ principles, is what we call *absurd.*’—‘ A clear explica‘ tion and enumeration of the principles of Common ‘ Senſe,’ adds Dr Reid, ‘ is one of the chief *desiderata* ‘ in logic.’

tenſive ſenſe, ſo as to comprehend probable as well as certain truths. 'I am able,' ſays he, 'to prove, that except we believe many things 'without proof, we never can believe any 'thing at all; for that all ſound reaſoning 'muſt ultimately reſt on the principles of com'mon ſenſe, that is, on principles intuitively 'certain, or intuitively probable; and, conſe'quently, that common ſenſe is the ultimate 'judge of truth, to which reaſon muſt conti'nually act in ſubordination.' (Eſſay on Truth, part 1. c. 1.) He had before defined Reaſon to be 'that faculty which enables us, 'from relations or ideas that are known, to 'inveſtigate ſuch as are unknown;' by which he plainly confines it to what has more uſually been called *reasoning*. This faculty he repreſents as totally diſtinct from Common Senſe, which ſignifies 'that power of the mind which 'perceives truth, or commands belief; not by 'progreſſive argumentation, but by an inſtan'taneous, inſtinctive, and irreſiſtible impulſe;

'derived neither from education, nor from 'habit, but from nature; acting independently 'on our will, whenever its object is preſented, 'according to an eſtabliſhed law, and there'fore properly called *Senſe;* and acting in a 'ſimilar manner upon all, or at leaſt a great 'majority of mankind, and therefore properly 'called *Common Senſe.*' (ut ſupra.)

Dr Campbell, as we may gather from his enumeration of the various kinds of evidence already quoted, employed the term in a more limited acceptation, as denoting only the faculty by which we are made acquainted with a limited claſs of firſt truths. The term is undoubtedly liable to conſiderable ambiguity, as, in common uſe, it is employed to denote not only the more ordinary application of our reaſoning powers, but alſo practical prudence, a quick diſcernment of propriety of conduct, or what is generally called worldly wiſdom. Even as defined by the philoſophers whoſe words we have juſt quoted, it is confeſſedly but a ſubſtitute for ſome other operation of the mind, or combination of operations, to which more preciſe names have been given. On this account, in what I have yet to ſay upon the ſubject of firſt principles, I ſhall not have recourſe to this undefined mental power in tracing their origin.

From the remarks made in the preceding Section, and the definition which has been given of Reaſon, it is evident that I cannot connot concur with Dr Reid in deriving the conviction which attends all intuitive truths, from the operation of judgment alone, or of common ſenſe, or even of the faculty of Reaſon, taken in its moſt extenſive ſignification. The evidence which accompanies certain of our faculties, ſuch as Conſciouſneſs, Perception, Memory, &c. I conceive to ſtand ſolely upon its own ground, and not to be reducible to any other claſs of evidence. Inſtead, therefore, of enumerating the various individual truths to which our aſſent is unavoidably given, I ſhall only attempt to aſcertain what are the faculties which, according to the conſtitution of man, are each accompanied with intuitive belief; at the ſame time examining under which of theſe the firſt principles enumerated in the preceding claſſifications are naturally comprehended; and how far all the particulars contained in theſe claſſifications are really entitled to the appellation of firſt truths.

SECTION III.

Claſſification of firſt Principles.

IN conformity to the plan mentioned at the concluſion of the preceding Section, I would propoſe the following enumeration of the ſources from which we derive our intuitive belief, or of thoſe original faculties of man which are each accompanied with a complete and independent conviction of the certainty of thoſe truths which they make known to us. 1ſt, The evidence of Conſciouſneſs: 2d, The evidence of Senſe: 3d, The evidence of Memory: 4th, The evidence of Reaſon: To which I have to add, 5th, The evidence of the Moral faculty.

1ſt, That the faculty of Conſciouſneſs is accompanied with an irreſiſtible belief of the real exiſtence of its objects, we have had occaſion particularly to ſtate, when treating of that faculty in Chapter 1. It is in conſequence of this law of our nature alone, that we believe ourſelves to be endowed with ſuch mental powers as Memory, Abſtraction, or Conception, or to poſſeſs the active principles of Curioſity, Benevolence, Friendſhip, or Pity.

In ſhort, upon the evidence of this faculty muſt reſt the whole ſcience of the human mind; which muſt neceſſarily be conſidered as a mere baſeleſs fabric, if it be denied that the evidence of Conſciouſneſs is certain and preciſe.

Under the evidence of Conſciouſneſs comes manifeſtly to be claſſed the firſt contingent truth in Dr Reid's enumeration. (See the preceding Section.) To the ſame claſs I am inclined likewiſe to refer the ſecond truth of the ſame enumeration; while the fourth ſeems to derive its origin from the joint operation of Conſciouſneſs and Memory; for, as has been obſerved in Ch. 1., the conviction of our perſonal identity cannot be derived from conſciouſneſs alone, without very abſurd conſequences.

To this firſt claſs alſo, I think, may juſtly be referred the 6th of Dr Reid's contingent truths, *viz.* 'that we have ſome degree of

‘ power over our actions, and the determina‘ tions of our will.’ That we poſſeſs, as a part of our conſtitution, that principle or faculty which is called Volition, or the active principle, and which is always exerciſed previous to every effort, or action of the individual, is, I think, as certainly made known to us by Conſciouſneſs, as that we have the intellectual faculties of Memory or Conception. But the very eſſence of this faculty conſiſts in directing and controuling our actions; and the determination of the will is nothing elſe than the exerciſe of volition. To ſay, therefore, that ‘ we have ſome degree of power over our ac‘ tions, and the determinations of our will,’ is the ſame thing as to ſay that we poſſeſs ſuch a faculty as *Volition*; and for this, I think, we have the direct evidence of Conſciouſneſs, and of Conſciouſneſs alone.

From this it ſeems to follow, that thoſe who argue againſt the free will and moral liberty of man, argue against the direct teſtimony of Conſciouſneſs; which informs us that we have the power of volition, or of freely willing and determining our actions. It likewiſe follows, that the poſitive ſide of this queſtion is incapable of any direct proof, other than a reference to Conſciouſneſs, as it is an intuitive truth, and ſelf-evident firſt principle. As far as I have examined the diſquiſitions concerning this much debated queſtion, theſe concluſions ſeem to me to be fully confirmed; for I find the advocates for moral liberty unable to bring forward any direct arguments in ſupport of their doctrine, but very ſucceſsful in expoſing the abſurdity and inconſiſtencies which follow from the tenets of their adverſaries, as well as the weakneſs of the reaſonings by which they are ſupported. Any further examination, however, of this queſtion, would be foreign to our preſent purpoſe.

I ſhould beg leave farther to ſuggeſt, whether we may not deduce from the conſciouſneſs of Volition, or the principle of activity, contraſted with what our ſenſes inform us concerning the characteriſtic properties of matter, our conviction of that truth, which Dr Reid has ranked as an axiom, and which moſt writers have conſidered as demanding our aſſent by its own proper evidence alone, *viz.* 'that 'whatever begins to exiſt, muſt have a cauſe 'to produce it?' If we ſtate this truth in the words of ſome writers, *viz.* 'that every 'effect muſt have a cauſe,' there is then no doubt of its being a neceſſary truth, implied in the very meaning of the words *cauſe* and *effect*, one of which has no ſignification without an alluſion to the other; ſo that the contrary of this maxim is not only falſe, but evidently abſurd and impoſſible. But if we ſtate the ſame truth in the other form given above, or perhaps ſtill more unexceptionably, as follows, 'every thing that begins to exiſt, and every 'change in the ſtate of exiſtence, is produced 'by the agency of an active being,' it does not then evidently appear, that the contrary of this maxim is palpably abſurd, however much we may believe it to be falſe and erroneous.

In proof of this, I apprehend that examples may be found, even in our moſt familiar reaſonings, where our notions concerning the peculiar agency that is ſubſervient to the phenomena which we obſerve, are by no means clear or explicit. When we obſerve a ſtone fall to the earth, a tree or a plant vegetate, the blood circulate, or the food digeſted, have we, I would aſk, a complete and ſteady conviction that theſe remarkable changes are produced by the direct interpoſition of active beings? The fall of a ſtone, we are now taught, by the philoſophy of Newton, to aſcribe to gravitation. But what is *gravitation?* Is it an inherent quality of matter, and conſequently not to be denominated an active, or efficient cauſe; or is it the reſult of the immediate operation of immaterial agents,

gents, commiſſioned to produce the phenomena which are aſcribed to this law of nature? Difficulties will be found in determining this queſtion either way; for gravitation evidently produces motion, or a change of ſtate; and, therefore, ſo far anſwers the deſcription of an efficient active cauſe: at the ſame time it follows fixed and conſtant laws; on which account it ſavours more of material inactivity, than of immaterial agency. The ſame remarks may be eaſily applied to all the natural phenomena uſually aſcribed to the various kinds of attraction; as alſo, though not perhaps ſo clearly, to the circumſtances which characterize vegetable and animal growth.

It is by no means my intention, in theſe remarks, to give the ſmalleſt countenance to the ſceptical dogma of Hume, that the belief of the neceſſity of efficient cauſes is a mere vulgar prejudice, and that there is no abſurdity in conceiving events to follow one another for ever, without the interpoſition of any active cauſe at all. On the contrary, I eſteem this doctrine, as ſtated by that philoſopher, to be highly erroneous. My ſole object is to aſcertain upon what footing our belief of the neceſſity of efficient cauſes, or of active powers, reſts; which, I think, has improperly been repreſented as a truth of the neceſſary kind; the contrary of which is inconceivable, and which cannot be derived from any other principle of belief.

The foundation of this belief appears to me, as already hinted, to be the conviction we have of our own activity, or voluntary agency, derived from Conſciouſneſs; and the knowledge we derive from our ſenſes of the inactivity or inertneſs of matter. We find the characteriſtic qualities of matter to be, not to move of itſelf, but to be moved exactly in proportion to the force that is impreſſed upon it; or for ever to remain at reſt, if no external force were applied to it. At the ſame time, we feel within ourſelves a principle of activity adapted to apply this impulſe to material objects, and by which numerous changes are actually produced in theſe objects. The immediate inference of reaſon is, that whereever a change is produced in material objects, ſome active or immaterial being muſt have been concerned, which conſtitutes the efficient cauſe of that change; and this inference never could have been made, without the operation of Conſciouſneſs and of Perception; and is, therefore, among the claſs of contingent, and not of neceſſary truths.

The obſervations that have been made above, on the ſubject of gravitation, and ſome other ſources of change in material objects, may ſeem to furniſh a ſtrong objection to this account of the matter; and it has been already acknowledged, that theſe phenomena are not eaſily reconciled to any hypotheſis concerning efficient cauſes. The following remarks may, perhaps, have ſome tendency to remove the difficulty. Although gravitation, in certain circumſtances, is clearly a cauſe of motion, or a change of ſtate; yet, without the cooperation of ſome other agency, its effects muſt ſoon come to an end. Were there no projectile force combined with gravitation in the planetary ſyſtem, what would be the conſequence? Manifeſtly, that the earth, and all the orbs which compoſe that ſyſtem, would advance, with an accelerated motion, towards the ſun, and at length combine in one ſolid and immoveable maſs with his body. When this took place, all motion, or change of ſituation, in as far as depends upon gravitation, would neceſſarily be at an end. The inference is plain, that gravitation has not the eſſential characters of an efficient or active cauſe, ſince, without the cooperation of other cauſes, it muſt ſoon ceaſe to produce motion. The projectile impulſe by which, in conjunction with gravitation, the immenſe orbs of our ſyſtem are made to wheel, with unabating velocity, in the regions of unbounded ſpace, around the ſun, the fountain of their light and heat, is the genuine token of voluntary efficiency, by which theſe ſublime phenomena are produced. In this we trace the operation of the great Firſt Cauſe of all, by whoſe dread fiat, worlds, and ſyſtems of worlds, firſt ſprung into exiſtence.

The ſame obſervations are, in ſome meaſure, applicable, not only to the other attractions, but, likewiſe, to the phenomena of vegetable and animal expanſion. The gradual evolution of a plant from the ſeed, and the formation of all its wonderful appendages, of leaves, ſtem, circulating veſſels, flowers, and fruit, are phenomena, upon which natural ſcience has yet thrown but very little light: This much, however, may ſafely be ſaid, that the due alternation of heat and cold, dryneſs and moiſture, are eſſentially requiſite to the production of theſe effects. But, did not the earth revolve around the ſun, as well as upon its own axis, we ſhould have no viciſſitudes of ſeaſons, no alternation of heat and cold, no refreſhing ſhowers, nor cooling breezes; all would be ſterile and deſolate; either burnt up by intolerable heat, or rendered torpid by unabating cold. One efficient cauſe, therefore, of vegetable, and the ſame may be ſaid of animal life, is to be ſought in that original mandate of Almighty agency, which cauſed the earth to wheel its ſtated courſe, that day and night, ſummer and winter, might regularly alternate.

It is not, however, without conſiderable diffidence, that I hazard theſe illuſtrations upon this difficult ſubject. There is, perhaps, no branch of metaphyſical ſcience that has occaſioned more perplexity than the relation between cauſe and effect; and much yet remains to be done, in order to remove the obſcurity in which our notions of the nature of this relation appear to be involved. The author of a mathematical proof of the abſurdity of the Neceſſarian ſyſtem, has thrown much light upon this ſubject; and it were greatly to be wiſhed that he could find leiſure and inclination to proſecute the inquiry which he has ſo ſucceſsfully begun.

The reſult to which theſe obſervations lead, is, that a cloſe examination of the circumſtances which characterize natural phenomena, compared with the dictates of our own conſciouſneſs, produces the ſteady conviction, that 'every change 'in the ſtate of exiſtence, is the reſult, either 'mediately or immediately, of the operation 'of an active being, or efficient cauſe.'* By conſequence, this truth is not a neceſſary one, nor, indeed, ſtrictly intuitive, ſince it is deduc-

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* It is ſomewhat remarkable that Mr Locke, when treating of the origin of ideas of relation, aſſigns to that of cauſe and effect, the compound action of ſenſation and reflection. 'I ſhall begin,' ſays he, (Book II. c. 25. '§ 11.)

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§ 11.) ‘ with the moſt comprehenſive relation, wherein ‘ all things that do, or can exiſt, are concerned; and that ‘ is, the relation of cauſe and effect: the idea whereof, ‘ how derived from the two fountains of all our knowledge, ſenſation and reflection, I ſhall, in the next ‘ place conſider.’ The inveſtigation, however, which follows, will not be found to have any ſimilarity to the preceding detail; and, as far as it is clear and explicit, ſeems to comprehend little more than an explication of the common meaning of the words cauſe and effect, viz. as things conſtantly conjoined, and ſucceeding each other. ‘ In the notice’, ſays he, (B. II. c. 26. § 1.) ‘ that our ‘ ſenſes take of the conſtant viciſſitude of things, we cannot but obſerve, that ſeveral particulars, both qualities ‘ and ſubſtances, begin to exiſt, and that they receive ‘ their exiſtence from the due application and operation ‘ of ſome other being. From this obſervation we get our ‘ ideas of cauſe and effect. That which produces any ‘ ſimple or complex idea, we denote by the general name, ‘ Cauſe; and that which is produced, Effect. Thus, ‘ finding that, in that ſubſtance which we call wax, fluidity, which is a ſimple idea, that was not in it before, ‘ is conſtantly produced by the application of a certain

‘ degree

ed by comparing together the evidence of Conſciouſneſs with that of Perception; but this deduction of reaſon, being merely a concluſion from particulars to generals, is ſo readily and clearly made, that it ſtrikes us with intuitive evidence, and may be conſidered, for every ordinary purpoſe, as carrying the force of a firſt principle. After all, moſt perſons may be inclined to admit this truth upon its own evidence, rather than upon the grounds here ſtated; and then it may be ranked among thoſe firſt principles, of the neceſſary kind, which are judged of by the faculty of Reaſon. The difference of opinion concerning the origin of the truth, in no way affects its evidence, or the certainty of the ſpeculations which are grounded upon it.

I have farther to remark, that this principle being

'degree of heat; we call the ſimple idea of heat, in relation to fluidity in wax, the cauſe of it, and fluidity the effect.'

being once admitted, another, which Dr Reid has ſtated as a ſeparate axiom, appears clearly to follow as an inference from it, *viz.* 'That 'deſign and intelligence in the cauſe, may be 'inferred with certainty from marks or ſigns 'of it in the effect.' If the cauſe is neceſſarily inferred from the effect, ſo muſt wiſdom in the cauſe be certainly inferred from marks of it exhibited in the effect; as well as a want of wiſdom in the cauſe, from the want of marks of it in the effect. Theſe are mere modifications, or particular examples of the general principle, which cannot be denied, if the principle itſelf be admitted, and, therefore, need not be ſtated as ſeparate grounds of intuitive belief.

2. Having given ſo ample an examination to the evidence of Conſcioufneſs, little remains to be ſaid concerning the ſecond ſource of intuitive belief, the evidence of Senſe. The objections to the certainty of this evidence have

already been examined, in Ch. III. § 3.; and it has been clearly ſhewn, that our knowledge of the nature and qualities of material objects muſt ultimately reſt upon the evidence of ſenſe alone. Hence, all phyſical ſcience, whether hiſtorical or philoſophical, whether mechanical, phyſiological, or chemical, muſt implicitly admit the evidence of ſenſe as a firſt principle. Upon this evidence too, if the preceding deduction, concerning the origin of our belief of efficient cauſes, be juſt, muſt, in part, be reſted that irreſiſtible conviction.

3. As the evidence of Senſe communicates to us the knowlege of every thing that is preſent in the material world; and the evidence of Conſciouſneſs informs us of whatever is paſſing in our own minds; ſo the evidence of Memory is the ſole ſource by which we have an immediate knowledge of what is paſt, whether of a material or intellectual kind. This, therefore, is a very extenſive

ground of our belief, and evidently gives authority to all the information we receive of the hiſtorical kind, whether relating to the phyſical or intellectual world.

To the evidence of Memory, in conjunction with that of Perception, may, I think, be referred the ground of our belief in the truth which makes the 10th of Dr Reid's contingent firſt principles, *viz.* 'That, in the phenomena of 'nature, what is to be, will probably be like 'to what has been in ſimilar circumſtances.' This conviction appears, to me, rather to be the reſult of experience, than an original and intuitive principle of belief. I can find no evidence that any ſuch conviction exiſts in the mind of a child, even when it firſt begins to reaſon; neither is it ſo ſtrong in ourſelves, as to lead us to conclude that the phenomena of nature will for ever be the ſame as they are at preſent; or that they have been, from all eternity, what they are now.

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On the contrary, every believer in the controul of a Supreme Power, has the conviction, that the ſun riſes and ſets, the planets revolve, and the ſeaſons return, in a certain order, ſolely becauſe God ſo ordained it, when it pleaſed him to call the earth and the heavens into exiſtence ; and that, at ſome unknown æra hereafter, the ſun and the moon, the heavens and the earth, may paſs away, and be as if they had never been. Nay, even within the limits of our own experience, we ſee ſomething very nearly approaching to a ſuſpenſion of the laws of nature. For, not to mention the miraculous events which Scripture informs us have, of old, taken place ; we muſt allow the eruption of the volcano, the burſting of the earthquake, or the fall of a ſtone from the clouds, to be appearances which depart very widely from the more ordinary courſe of natural phenomena.

The conviction, therefore, which we have of the regular return of the phenomena of nature, ſeems to amount to no more than this, that there is a very high probability, reſulting from paſt experience, that this will be the caſe: ſuch a probability as ſufficiently warrants us to make a ſtudy of theſe phenomena, and to aſcertain, as far as we are able, their nature and laws.

It is evident that the third of Dr. Reid's contingent truths is to be ranked under the evidence of Memory; as the fifth, and I think, likewiſe, the eighth, are reducible to the evidence of Senſe, aided by reflection, or a ſlight degree of the reaſoning faculty. With regard to the tenth and eleventh of thoſe truths, they ſeem to be rather improperly claſſed among intuitive firſt principles, as they refer, not to evidence which we hold to be certain, but only to what is admitted as probable.

The foundation of our belief in human

teſtimony, (the 10th in the enumeration), appears to me to be the conſciouſneſs we have of a regard to veracity, exiſting in ourſelves. Whether this regard to truth muſt be aſcribed to an original principle in the human conſtitution, called by Dr Reid *the principle of veracity*, (ſee Inquiry into the Human Mind, Ch. VI. § 24.); or, whether it may be conſidered as an immediate dictate of conſcience, or the moral faculty, which tells, in language not to be miſunderſtood, that deceit is a crime, it is not our buſineſs here to examine. But I think, if it be allowed that a regard to truth is natural to the mind of man, we are furniſhed with a ſufficient reaſon for giving credit to our fellow creatures, whom we have every cauſe to believe to be conſtituted as we are ourſelves. Hence, whatever neceſſity there may be for admitting Dr Reid's *principle of veracity* as an original faculty in man, I can ſee none for the admiſſion of his *principle of credulity*, (ſee as above), any more than there could be for add-ing a duplicate to every one of the faculties of the human mind, for the purpoſe of giving the proper aſſent to the correſponding faculty in the minds of our neighbours.

Experience informs us, that a regard to truth is ſometimes counteracted by oppoſing principles in human nature; either by miſapprehenſion of the real ſtate of the caſe, or a deliberate intention to deceive. We do not, therefore, when come to years of maturity, implicitly admit the teſtimony of others; but, previous to giving it our aſſent, we carefully examine what are the probable ſources, either of wilful miſrepreſentation, or unintentional miſtake, as far as theſe are made known to us by our experience or obſervation. Hence it is evident, that though human teſtimony is a very copious ſource of our knowledge, its evidence amounts to no more than probability; although, in many caſes, it may approach very near to certainty.

Before proceeding to the next claſs of intuitive truths, we ſhall juſt take notice of the ninth article in Dr Reid's enumeration, as it may as well be introduced here as any where elſe. It muſt be acknowledged that it is not eaſy to account for the interpretation of natural ſigns by any known principles of human nature; or, ſuppoſing that this muſt be conſidered as an ultimate principle, incapable of explanation, to ſay under which of our claſſes of intuitive belief it is to be placed. According to an ingenious explanation which has been offered of this difficulty, natural ſigns, or the involuntary expreſſions of feeling and paſſion, are interpreted through the agency of ſympathy, by which ſimilar expreſſions and geſticulations are excited in the beholders; and ſuch is the wonderful connexion between ſoul and body, that the geſticulations of the latter cannot take place without the correſponding emotions being excited in the former. Thus, natural ſigns are interpreted, not by immediate inſtinct, but by a participation in the feeling and the admonitions of Conſciouſneſs. Without examining whether this explanation be perfectly ſatisfactory, I ſhall conſider it as a ſufficient apology for not ranking the interpretation of natural ſigns among the ultimate and intuitive principles of our belief.

4. We come then to the fourth claſs of intuitive truths, the evidence of Reaſon, which I have conſidered in a light conſiderably different from that in which it has uſually been viewed by metaphyſical writers. The office of the faculty of Reaſon I have ſtated to be ‘ to make us acquainted with abſtract or neceſſary truth,’ (Ch. VIII. § 1.); ſo that, by the evidence of reaſon is meant, our aſſent to thoſe general ſelf-evident truths called axioms, for the belief of which no cauſe can be aſſigned but their ſelf-evidence, and of which the contraries are conceived to be abſurd and impoſſible. The ſeventh of Dr Reid's contin-

gent truths, and the only one of which we have not already taken notice, is evidently but another way of ſtating, that there is ſuch a thing as the evidence of Reaſon, by which truth can be diſcriminated from error.

The evidence of Reaſon, then, is that by which we are informed of the claſs of truths uſually called Neceſſary, in contradiſtinction to thoſe made known to us by the faculties of Conſcioufneſs, Perception, and Memory, which have been denominated Contingent. What Dr Beattie calls mathematical evidence, and Dr Campbell mathematical axioms, the reſult of pure *intellection*, belong to this claſs of truth. Dr Reid, indeed, gives a more extenſive range to the claſs of neceſſary truth, and ranks axioms under a variety of different ſpecies, according to the different ſciences to which he conceives them to belong.

I am rather of opinion, that thoſe truths which are juſtly entitled to the name of axioms, belong equally to all the ſciences, and are by no means very numerous. It has indeed been the practice, in the elementary treatiſes of mathematics, formally to enumerate thoſe axioms, or general truths, which are there taken for granted; becauſe that ſcience purſues accuracy of method more than any other. But it would be by no means difficult to ſhew, that ſeveral at leaſt of the axioms which Euclid has enumerated at the beginning of his Elements, are tacitly employed in almoſt every kind of reaſoning, though not as preciſely expreſſed in mathematical language. In every kind of claſſification, for example, we evidently proceed upon the admiſſion of theſe axioms, that 'things which agree with the 'ſame thing, agree with one another;' and that 'things which diſagree with the ſame 'thing, do not agree with one another;' but theſe are in fact the ſame, though more generally expreſſed, as Euclid's 1ſt, 2d, 3d, 4th, &c. axioms.

Again, Euclid himſelf has employed, in his reaſonings, various axioms, which are not to be found in his previous enumeration; as, for example, this one, 'whatever is true of the 'genus, is true of all the ſpecies and indivi-'duals of that genus;' which is called by Dr Reid a logical axiom. For he proves of triangles in general, or of the genus only, that the three angles are equal to two right angles; which truth he afterwards applies to the various ſpecies of triangle, the equilateral, iſoſceles, or ſcalene, as occaſion may require; and thus, in this caſe, as well as many others that might be mentioned, evidently takes for granted the above axiom. Another axiom, more ſtrictly mathematical, which he has omitted, is this, 'that the whole is equal to all its parts taken 'together;' although it would be eaſy to ſhow, that this is tacitly implied in his reaſonings: and there is likewiſe another, upon which the whole evidence of the *demonſtratio ad abſurdum* reſts; although I do not recollect to have ſeen it diſtinctly ſtated by Euclid, or any other writer, *viz.* ‘ It is impoſſible for the ‘ ſame thing to have, at the ſame time, quali‘ ties which are plainly inconſiſtent with each ‘ other. ’

It is by no means my intention to attempt an enumeration of all thoſe truths which are truly and legitimately entitled to the name of axioms, or firſt principles of reaſon. They are, as I have already hinted, probably not very numerous; and reaſon, when clear and unbiaſſed, will generally, of itſelf, give an accurate deciſion concerning the ſelf-evidence of ſuch neceſſary truths. At the ſame time, very conſiderable miſtakes have been made in this matter, even by perſons of the greateſt acuteneſs. Thus, it is generally acknowledged, that what Euclid calls the laſt, or 12th axiom, is very improperly ſo conſidered; as it is a truth by no means ſelf-evident, but which requires and admits of a proof as much as many of thoſe which form his propoſitions. It is likewiſe well known, that all the ancient philoſophers admitted, as an axiom or ſelf-evident truth, the maxim, 'ex nihilo nihil fit;' without conſidering that this neceſſarily led to the eternity, and conſequently independence of matter, which modern philoſophy teaches us to conſider as abſurd. Another maxim, which appears to have been admitted by all philoſophers down to the time of Dr Reid, was, 'that nothing 'can act but when and where it is preſent;' upon which alone reſts the evidence of the ideal theory; but which, being rejected as really deſtitute of evidence, that theory at once falls to the ground.

Even in the enumeration of Dr Reid, it does not appear that all the truths which are there ſtated as axioms, are juſtly entitled to that name. We have already endeavoured to trace ſome of thoſe which he calls metaphyſical axioms, to other principles of belief. What he calls axioms of morality, belong to our next general claſs of evidence; and, with reſpect to the principles by which Taſte is regulated, I am doubtful if any of them can be conſidered as having the evidence of an axiom, or even as admitting of clear and certain proof. I am likewiſe ſceptical with regard to the exiſtence of any axioms which peculiarly belong to grammar, and think the one ſpecified by Dr Reid at leaſt admits of diſpute: For it may be ſaid that *No*, *Yes*, *Where?* *What?* and various other like expreſſions, form complete ſentences, without any aid from the verb.

Axioms ought to be diſtinguiſhed from identical propoſitions, which are no more than a multiplied expreſſion of the ſame truth; as for example, the truiſms, 'whatever *is*, *is*;'— 'things which are equal are of the ſame dimenſions,' &c. Such arithmetical truths as theſe, '2 and 3 are 5;' '4 and 5 are 9,' &c. although, by ſome, they have been denominated axioms, ſeem rather to be of the nature of identical propoſitions, and amount to no more than this, '5 denotes the ſame number as 2 and 3 taken together;' '9 is the ſame as 4 and 5 together.' Dr Campbell (Philoſophy of Rhetoric, b. 1. c. 5. § 1.), while he admits this to be the caſe, yet ſeems to conſider ſuch truths as the following as real axioms: '2 and 3 are equal to 4 and 1;' '4 and 5 are equal to 6 and 3,' &c.; becauſe they convey a new idea, and imply an equation, or new relation of equality. But allowing that theſe are not to be conſidered as identical propoſitions, or mere variations of expreſſion, they ſeem rather to be concluſions inferred from axioms, and the principles of notation, than original axioms. Such truths admit of proof as follows: 'the ſum of 2 and 3 is 5; the ſum of 4 and 1 is likewiſe 5; whence the ſum of 2 and 3 is equal to the ſum of 4 and 1; becauſe things which are ſeverally equal to the ſame thing, are equal to one another.'

I ſhall conclude theſe obſervations on the ſubject of axioms, or neceſſary firſt principles, with this remark,—that the true criterion of an axiom ſeems to be, in the firſt place, the manifeſt abſurdity of denying it, or maintaining its oppoſite; and, in the ſecond place, the impoſſibility of proving it by any thing more evident than itſelf.*

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* There are ſome ingenious obſervations on the ſubject of axioms, in Condillac's 'Art de raiſonner,' (liv. 1. c. 1.) I cannot, however, agree with this philoſopher in conſidering the evidence of an axiom as reſolvable into the *identity* of its ſubject and predicate. 'Pourquoi,' ſays he, 'celui qui connaît exactement les idées qu'on 'attache aux differens mots de cette propoſition, *un tout* '*est egal à ses parties prises ensemble*, ne peut-il pas douter 'de ſon evidence? C'eſt qu'il voit qu'elle eſt identique, 'ou qu'elle ne ſignifie autre choſe, ſinon qu'un tout eſt 'égal à lui-même.' This laſt identical propoſition, or *truism*, I conceive to be by no means equivalent to the import of the axiom quoted by Condillac. This ingenious author, however, proceeds afterwards to apply the ſame principle to the evidence of *demonstration*, which, he ſays, conſiſts in nothing more than a ſeries of propoſitions, which are each identical with that which follows.

5. I have ſtated, as a fifth ſource of intuitive belief, the evidence of the Moral faculty. To this I have been induced, from a conviction that our deciſions concerning right and wrong, virtue and vice, cannot be ſatisfactorily explained upon any other principle than a reference to an original power of the mind, or internal ſenſe, as it has been called by Hutchiſon. Some have endeavoured to reſolve the dictates of morality into a refined ſelfiſhneſs; ſome into an exerciſe of reaſon; ſome into conſiderations of utility; ſome into motives of benevolence; and ſome into an obedience to the will of God. But all theſe ſyſtems are attended with difficulty, and appear inſufficient to explain the paramount authority of moral ſanction. Theſe difficulties in a great meaſure vaniſh, if, with Hutchiſon, Butler, Reid, and various other reſpectable philoſophers, we refer the principles of morality to the immediate dictates of an original faculty, of whoſe operation we have very clear evidence, when, under the name of *conſcience*, it ſcrutinizes our own conduct.

This faculty is chiefly employed in immediately prompting to action, and does not therefore come within the plan of a work which is expreſsly confined to an analyſis of the powers of the underſtanding. At the ſame time, by the operation of the moral faculty, a new and very important claſs of notions is introduced into the human mind; and hence, this faculty, in certain reſpects, is to be conſidered as an intellectual power. It is on this account that Dr Reid has added 'Moral Perception' to his enumeration of the Powers of the human underſtanding, (Eſſay I. on the Intellectual Powers, c. 7.); although he has not treated of it in that volume which he has more expreſsly devoted to the examination of thoſe powers, but in his ſubſequent work on the active powers of man.

It may be aſked, are the intuitive truths, or firſt principles, which are made known to us by the moral faculty, neceſſary or contingent? This query I own I do not feel myſelf ſufficiently prepared to anſwer deciſively. Sound moraliſts have been accuſtomed to conſider the ſanctions of virtue as immutable and eternal, and conſequently not contingent, or exiſting merely becauſe the Supreme Being has ſo willed it. It might be conſidered as tending to weaken the controul of conſcience, if its diſtinctions were repreſented as having a reference only to the preſent ſtate of things, and not neceſſarily the ſame in every conceivable ſtate and relation of being. In fact, however, the evidence and certainty of a contingent truth is equally great as that of a neceſſary one; ſo that the authority of the moral ſenſe will not be diminiſhed, whether we refer thoſe firſt principles of belief, which it makes known to us, to the claſs of contingent, or of neceſſary truths. But as a further inveſtigation of this point would lead into details which more properly belong to a ſyſtem of Ethics, I ſhall leave it to be diſcuſſed by thoſe who are better qualified for the taſk than I feel myſelf to be.

SECTION IV.

Of Definition, and the various Kinds of Proof.

HAVING now, at ſome length, examined into the nature of firſt principles, or thoſe intuitive truths which are made known to us, not only by reaſon, but likewiſe by ſeveral others of our faculties, it remains that we ſhould inquire into the application of our rational powers, in the diſcovery of truth which is not intuitively perceived; or in accompliſhing the proceſs of reaſoning. Previous to this, however, I propoſe to make ſome obſervations on the nature of definition; as all legitimate proof muſt be founded upon a clear and accurate conception of the ſubject to which the proof relates; that is, upon a juſt and adequate definition, or at leaſt explanation of the matter in queſtion.

Upon the ſubject of Definition, the genius of Ariſtotle was ſedulouſly exerciſed; and it has been pretty generally ſuppoſed, that his account of the matter is not only ingenious, but very juſt and philoſophical. A definition, ſays Ariſtotle, is a ſpeech, declaring what a thing is. But the eſſence of a thing conſiſts of theſe two parts; firſt, what is common to it with other things of the ſame kind; and ſecondly, what diſtinguiſhes it from other things of the ſame kind: the firſt is called the genus, the ſecond the ſpecific difference. Hence, the province of a definition is, to aſſign the genus and ſpecific difference of the thing defined. Thus, ſays Dr Iſaac Watts (Logic, part 1. c. 6. § 4.), 'if I would define what *winter* is, I conſider, 'firſt, wherein it agrees with other things 'which are moſt like it, namely, *ſummer*, '*ſpring*, *autumn*, and I find they are all *ſeaſons of the year*; therefore, *a ſeaſon of the* '*year is the genus*. Then I obſerve wherein 'it differs from thoſe, and that is in the *ſhort-*

' *neſs of the days;* therefore, this may be call-
' ed *its ſpecial nature*, or its *difference.* Then,
' by joining theſe together, I make a *definition.*
' *Winter is that ſeason of the year wherein the*
' *days are ſhortest.*'

This account of definition has conſiderable plauſibility; but, at the ſame time, it is liable to very material objections. In the firſt place, it is evident that it depends entirely upon our having a complete and ſatisfactory claſſification, properly arranged under genera and ſpecies, of all the objects which we propoſe to define. But ſuch a claſſification is no where to be found; nor will different perſons agree with one another concerning what conſtitutes a genus, and what a ſpecific difference. Thus, Dr Watts himſelf acknowledges (in the ſection above quoted), that ' ſome would as ſoon define *winter* by the *coldneſs of the ſeaſon*, as ' by *the ſhortneſs of the days;*' though he conceives the laſt to be ' doubtleſs the moſt juſt, 'primary, and philoſophical difference betwixt 'that and the other ſeaſons of the year.'

The bad ſucceſs which has uniformly attended all attempts at an enumeration, or general claſſification, of all the objects of human knowledge, ought long ago to have ſhown the fallacy of the Ariſtotelian account of definition. Various ſuch attempts have been made, but all ſo greatly differing from each other, as to evince that no reliance can be placed on any of them. Plato propoſed an arrangement of every thing under five general heads, or categories, *viz.* 'Subſtance, Identity, Diverſity, Motion, or Reſt.' Ariſtotle extended the number of categories to ten; and Mr Locke ſeems to have thought that three ſuch general heads were quite ſufficient, *viz.* 'Subſtances, Modes, and Relations.' Perhaps no philoſopher, except Ariſtotle, has beſtowed ſo much conſideration upon the ſubject of general diviſion, as the celebrated Biſhop Wilkins. His 'Eſſay towards a real character 'and philoſophical language,' proceeds upon the plan of arranging all the objects of human knowledge under various genera, which are again ſubdivided into their ſpecies and individuals, in order that each may be ſyſtematically diſtinguiſhed by its appropriate character. The number of his *summa genera*, or what may be called his categories, is forty; and each is divided into numerous ſpecies: but, in the preſent advanced ſtate of knowledge, it may be doubted whether any one of his genera would be conſidered as very judiciouſly choſen, and, ſtill more, whether it would be admitted that the various ſpecies peculiarly belong to one genus rather than to another.

In particular branches of ſcience, indeed, diviſions and claſſifications are neceſſarily employed for the ſake of convenience and perſpicuity; and in reference to ſuch claſſifications, the Ariſtotelian account of definition has its value. Thus, in natural hiſtory, the various objects of inquiry have been carefully diſtributed into claſſes, orders, genera, ſpecies, and varieties; and in many caſes here, a definition may be ſaid to conſiſt in aſſigning the genus and ſpecific difference of the thing defined. But ſtill it muſt be recollected, that theſe claſſifications are in general arbitrary, are liable to be changed according to the fancy of their inventors, and are ſeldom founded in the preciſe diſcriminations of nature. Hence, the definitions founded on theſe arrangements muſt be viewed rather as convenient expedients for the purpoſes of nomenclature, than as conveying juſt notions of the nature of things. In thoſe branches of knowledge where no claſſification has been ſettled by general conſent, we may venture to aſſert, that no benefit will accrue from an attempt to ſettle, by definition, the genus and ſpecific difference of the objects of our inquiry.

But again, it is evident, that even ſhould we ſuppoſe a ſatisfactory claſſification of every object of knowledge to exiſt, ſtill this logical ſyſtem of definition is imperfect; for the higheſt genus or category itſelf could not be defined, becauſe it is not a ſpecies; nor could individuals be defined, becauſe they have no ſpecific difference. There are, beſides, many ſpecies of things, whoſe ſpecific difference, though clearly perceived, ſcarcely admits of being expreſſed by any form of words: Such are the various ſpecies of colour, of which the difference is clearly diſcernible by the eye, but cannot at all be expreſſed by definition.

The firſt writer who ſeems clearly to have perceived the fallacy of the logical account of definition, is Mr Locke. 'Though,' ſays this philoſopher (b. 3. c. 3. § 10.), 'defining 'by *genus* and *differentia* be the ſhorteſt way, 'yet I think it may be doubted whether it be 'the beſt. This, I am ſure, it is not the only, and ſo not abſolutely neceſſary. For, de-

‘ finition being nothing but making another ‘ underſtand, by words, what idea the term ‘ defined ſtands for, a definition is but made ‘ by enumerating thoſe ſimple ideas that are ‘ combined in the ſignification of the term defined; and if, inſtead of ſuch an enumeration, men have accuſtomed themſelves to uſe ‘ the next general term, it has not been out of ‘ neceſſity, or for greater clearneſs, but for ‘ quickneſs and deſpatch ſake. ’

In this paſſage, according to my apprehenſion, the true and juſt notion of definition is conveyed, which, according to this view of the ſubject, ſhould conſiſt of an enumeration of the various ſimple attributes or properties comprehended in the thing defined. It follows, that things, or notions, which are themſelves ſimple, do not admit of definition; but all thoſe that are complex do. ‘ The names ‘ of ſimple ideas’ ſays Mr Locke (b. 3. c. 4. § 4.) ‘ are not capable of any definition; the 'names of all complex are:' And he appears to have the merit of firſt diſtinctly ſtating this truth; for he immediately ſubjoins, 'It has 'not, that I know, been yet obſerved by any 'body, what words are, and what are not, ca'pable of being defined; the want whereof is '(as I am apt to think) not ſeldom the occa'ſion of great wrangling and obſcurity in 'mens diſcourſes.'

It is well known what ridiculous controverſies aroſe in the ſchools, and among the ancient philoſophers, from the attempt to define things which, from their ſimple nature, are incapable of definition; as, for example, the defining motion to be, 'the act of a being in power, 'ſo far as it is in power;' and light, 'the 'act of perſpicuous, as far as it is perſpicu'ous.' Such things admit properly of no definition, nor of any other explanation, than the ſubſtitution of a ſynonymous term, or circumlocution, calculated preciſely to fix the meaning of the word, by ſhewing what notion it is intended to expreſs, to the excluſion of every other. Thus, ſometimes we find motion defined to be 'a change of place;' this, however, is merely a ſynonymous expreſſion; for no perſon could underſtand what is meant by a change of place, who had no conception of motion. The definitions I have attempted to give of the various intellectual powers, are all of this kind, and would be void of meaning to a perſon who was not himſelf poſſeſſed of thoſe powers.

This kind of definition correſponds to what the Logicians call 'the definition of the name,' being the mere explanation of a word; while 'the definition of the thing,' according to them, informs us of the real eſſences of objects. The definition of the thing, according to our view of the ſubject, informs us, not of the eſſence, but only of the various qualities of the object defined; not all of them, but ſuch as are ſufficient to diſcriminate it from other like objects; and the definition of the name, which, for the ſake of diſtinction, may be called deſcription, attaches excluſively to ſome ſimple notion, an appropriate name. It is not the individual things of nature, as the Logicians teach us, but theſe ſimple notions, that are incapable of definition. For what hinders that I ſhould convey a clear notion by definition, or an enumeration of their various characteriſtic qualities, of the individuals John, James, London, or Edinburgh; but who can tell by definition, wherein the colour blue differs from red; or an acid taſte from a bitter?

At the ſame time, it appears to be juſtly remarked by Mr Locke, that, 'though the 'names of ſimple ideas have not the help of 'definition to determine their ſignification, yet 'that hinders not, but that they are generally 'leſs doubtful and uncertain, than thoſe of 'mixed modes and ſubſtances; becauſe they

‘ ſtanding only for one ſimple perception, men, ‘ for the moſt part, eaſily and perfectly agree ‘ in their ſignification; and there is little room ‘ for miſtake and wrangling about their mean‘ing.’ (Book III. c. 4. § 15.) Whatever is complex in its nature, is generally but imperfectly underſtood; and the name which uſe has attached to it, may excite, in different individuals, notions which are conſiderably different from each other. Hence the neceſſity for adequate definitions of all complex terms; and, whether they are adequate or not, may pretty certainly be known by obſerving, whether they convey the ſame preciſe notion to all perſons of a competent underſtanding, both thoſe who are acquainted with the thing defined, and thoſe to whom it may be entirely new. We may mention, as an example of ſuch an adequate definition, that which Euclid has given of a rhombus, (B. I. def. 32.) which, it is apprehended, will convey a diſtinct conception of that particular figure, even to a perſon who had never ſeen or heard of it before.

The general reſult of theſe obſervations is, that ſimple notions do not admit of being defined otherwiſe than by a deſcription, or preciſe limitation of the term which expreſſes them. Complex notions are defined by an enumeration of their moſt remarkable, or characteriſtic ſimple properties, and may thus be made known by definition to perſons to whom they are new; provided they contain no ſimple property which is unknown to thoſe perſons. *

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* Mr Locke, in B. III. c. 11. § 25. of his eſſay, ſuggeſts the following ingenious expedient for giving preciſe notions of things, which, on account of their ſimplicity or peculiarity, do not admit of being defined. 'It were to 'be wiſhed,' ſays he, 'that men, verſed in phyſical 'inquiries, and acquainted with the ſeveral ſorts of na'tural bodies, would ſet down thoſe ſimple ideas, where'in they obſerve the individuals of each ſort conſtantly 'to agree. But a dictionary of this ſort, containing, as 'it were, a natural hiſtory, requires too many hands, as 'well as too much time, coſt, pains, and ſagacity, ever to 'be hoped for. Yet, methinks, it is not unreaſonable to 'ſuppoſe,

We are next to inquire into the nature of the proceſs of induction or reaſoning, that admirable

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'ſuppoſe, that words, ſtanding for things which are 'known and diſtinguiſhed by their outward ſhapes, 'ſhould be expreſſed by little draughts and prints made 'of them. A vocabulary, made after this faſhion, would, 'perhaps, with more eaſe, and in leſs time, teach the 'true ſignification of many terms, eſpecially in languages 'of remote countries or ages, and ſettle truer ideas in 'men's minds, of ſeveral things whereof we read the 'names in ancient authors, than all the large and laborious 'comments of learned critics. Naturaliſts, that treat of 'plants and animals, have found the benefit of this way; 'and he that has had occaſion to conſult them, will have 'occaſion to confeſs that he has a clearer idea of *opium* 'or *ibex*, from a little print of that herb, or beaſt, than he 'could have from a long definition of the names of either 'of them. And ſo, no doubt, he would have of *strigil* 'and *sistrum*, if, inſtead of a *currycomb* and *cymbal*, which 'are the Engliſh names dictionaries render them by, he 'could ſee ſtamped in the margin ſmall pictures of theſe 'inſtruments, as they were in uſe amongſt the ancients. '*Toga*, *tunica*, *pallium*, are words eaſily tranſlated by '*gown*, *coat*, and *cloke*; but we have thereby no more 'true ideas of the faſhion of thoſe habits amongſt the 'Romans, mirable expedient, by which hidden truth is brought to light, and which has, therefore, ſo deſervedly exerciſed the ingenuity of inquiſitive men. I have already had occaſion to remark, that I do not conſider the inductive proceſs as the province of any peculiar or appropriate faculty, but merely to be the ſucceſſive application of thoſe truths which are intuitively acquired, principally by the faculty of Reaſon;

'Romans, than we have of the faces of the taylors who 'made them.'

The ingenious Abbé de l'Epée informs us, in his account of the inſtitution for the deaf and dumb at Paris, that his academy was amply ſtocked with prints and drawings of all kinds of natural and artificial objects, for the purpoſe of communicating accurate ideas of ſuch objects to his pupils.

Bacon diſplays his uſual acuteneſs and judgment on the ſubject of Definition. 'Quæ tamen definitiones,' ſays he, 'in rebus naturalibus et materiatis locum non 'habent: nam definitiones ipſæ ex verbis conſtant, et 'verba gignunt verba. Igitur oportet ad inſtantias par'ticulares earumque ſeries et ordines recurrere.' (*Nov. Org.*)

ſon; ſo as to bring to light, truths which are not themſelves immediately perceived by any of our faculties. (See Ch. VIII. § 1.)

The moſt general diviſion of reaſoning or proof, is into the demonſtrative and probable. In the firſt ſpecies, the evidence of every ſtep of the inductive proceſs muſt be clear and certain; and we muſt perceive it to be impoſſible that, if the premiſes be true, the concluſion ſhould be falſe. If, in any ſtep of the induction, this neceſſary dependence is not ſeen, it ceaſes to be demonſtrative; for the evidence of the final concluſion can be no greater than that of the weakeſt link of the chain of reaſoning. In probable reaſoning, this neceſſary connexion between the premiſes and concluſion is not apparent; nor do we perceive it to be impoſſible that the firſt ſhould be true while the laſt is falſe.

It follows from this, that demonſtrative reaſoning has no degrees. One demonſtration cannot be ſtronger than another, although it may be more perſpicuous, more elegant, or more ingeniouſly conceived. It follows alſo, that it is ſuperfluous to give more than one demonſtration of the ſame truth. But the ſtrength of probable reaſoning depends more upon the number of its arguments, all tending to one point, than upon the force of any one individual argument; and this kind of proof admits of all degrees, from the ſlighteſt probability to the ſtrongeſt, which may be conſidered as amounting to a complete certainty. 'Such evidence,' ſays Dr Reid, (Eſſay VII. on the Intellect. Powers, c. 3.) 'may be compared to a rope made up of many ſlender 'filaments twiſted together. The rope has 'ſtrength more than ſufficient to bear the 'ſtreſs laid upon it, though no one of the 'filaments of which it is compoſed would be 'ſufficient for that purpoſe.'

It has been generally laid down, that demonſtrative reaſoning is applicable to truths of the neceſſary kind only. ‘ It was, I think,’ ſays Dr Reid, (Eſſay VII. on the Intellectual Powers, c. 1.), ‘ the opinion of all the ancients, ‘ that demonſtrative reaſoning can be applied ‘ only to truths that are neceſſary, and not to ‘ thoſe that are contingent.’ ‘ In this,’ adds he, ‘ I believe they judged right. Of all created things, the exiſtence, the attributes, and, ‘ conſequently, the relations reſulting from ‘ thoſe attributes, are contingent. They depend upon the will and power of him who ‘ made them. Theſe are matters of fact, and ‘ admit not of demonſtration.’

This is, perhaps, too much narrowing the field of demonſtration, and limiting the term to a more circumſcribed import than legitimate uſage requires. If, indeed, it be true, as Dr Reid, afterwards infers, that ‘ the field of demonſtrative reaſoning, therefore, is the various relations of things *abstract*, that is, of

‘ things which we conceive, without regard to ‘ their exiſtence ;’ then, it no doubt will follow, that demonſtration can be applied only to neceſſary truths, becauſe ſuch abſtract relations are all of the neceſſary kind. But I conceive, that, taking the term demonſtration in its uſual ſignification, and as above defined, it may frequently be applied to inductive proceſſes, founded upon contingent evidence. Many of the inductive proceſſes in mechanical philoſophy are clearly demonſtrative, and even in the very form and language of mathematical reaſoning; yet they muſt all reſt originally on obſerved facts or experiments, that is, upon the contingent evidence of the ſenſes.

At the ſame time, it may be allowed to be thus far true, with reſpect to all demonſtration being grounded upon neceſſary truth, that, in demonſtrative proof, every ſtep of the induction muſt conſiſt of the clear and juſt application of ſome neceſſary truth, or abſtract principle of

reaſon,

reaſon, *i. e.* of what is uſually called an axiom. This I apprehend to be the true characteriſtic of demonſtration, and that which makes us clearly perceive that there is a *neceſſary* connexion between the premiſes and concluſion. The firſt, or moſt elementary propoſitions of the demonſtrative kind, furniſh the plaineſt examples of the application of theſe axioms; in the ſucceeding propoſitions, theſe elementary theorems are reſorted to during the proof, which thus, in fact, reſts on preciſely the ſame axioms, although they are not ſpecifically quoted.

Dr Reid having limited the field of demonſtration to neceſſary truth, can find only two claſſes of ſtrictly demonſtrative reaſonings, *viz.* the metaphyſical and mathematical, (*ut ſupra.*) In the firſt, however, he ſays, the proceſs is always ſhort, and the concluſion is but a ſtep or two removed from the firſt principle, or axiom, on which it is founded; while the different concluſions depend not upon one another. It is far otherwiſe in mathematical reaſoning, which conducts into an unbounded field of diſcovery. This is aſcribed, by Dr Reid, to the endleſs relations of quantity, in reſpect of magnitude, figure, diviſibility, ratio, &c.

It evidently cannot be meant by Dr Reid, that Metaphyſics is a ſcience, demonſtrable in all its parts, like Mathematics. He was too well acquainted with the general uncertainty of metaphyſical ſpeculations to have advanced ſuch an opinion. If, then, he aſſerts only that ſeveral metaphyſical truths admit of demonſtration, the ſame ought, doubtleſs, to be ſaid of Phyſics, many of the reaſonings of which have at leaſt as much of demonſtrative certainty, as any of the ſpeculations of Metaphyſics. The truth appears to be, that every branch of ſcience may occaſionally aſſume the demonſtrative form. The exiſtence of a Deity, the immateriality of the human ſoul, and other moral or metaphyſical truths, have, perhaps, been as fairly demonſtrated as the Pythagorean propoſition, or the parabolic motion of projectiles. But ſome ſciences are much more ſuſceptible of this kind of proof than others; phyſics, admitting much more of demonſtration than metaphyſics or morals. Of all the ſciences, Mathematics is that which admits the moſt largely of demonſtration. Its firſt principles are ſo certain, ſo definite, and clear; and its manner of proof ſo accurate and legitimate, that it may be fairly called a completely demonſtrative ſcience, and the only one which is juſtly entitled to that name.

Wherever demonſtration cannot be obtained, we muſt be ſatisfied with probable evidence; to which we ſhould only give a degree of aſſent, proportioned to the ſtrength of the argument. Thus, it would be fooliſh to have much confidence that it will rain to-morrow, although the appearance of the clouds of to-day may indicate it. But it is wiſe to entertain the ſtrongeſt conviction of the immortality of the human ſoul, and of a ſtate of future rewards and puniſhments; becauſe the arguments for the reality of theſe truths are numerous, ſtrong, and convincing.

Dr Reid has given the following enumeration of the principal kinds of probable evidence, (Eſſay VII. on the Intellect. Powers, c. 3.) 1ſt, Human teſtimony. 2d, The authority of thoſe who are good judges of the point in queſtion. 3d, That evidence by which we recognize the identity of things, and perſons of our acquaintance. 4th, The evidence of men's future actions and conduct, from the general principles of action in man, or from our knowledge of the individuals. 5th, That by which we collect men's characters and deſigns from their actions, ſpeech, and other external ſigns. 6th, The probability of chances; and, 7th, The evidence by which the known laws of nature have been diſcovered, and the effects which have been produced by them in former ages, or which may be expected in time to come.

I am inclined to prefer to this enumeration of Dr Reid, the arrangement of probable evidence propoſed by Dr Campbell, and already ſtated in Sect. 2. of this Chapter: According to this arrangement, probable evidence is divided into, 1ſt, The knowledge we derive from experience; 2d, That from analogy; 3d, Teſtimony; and, 4th, The calculation of chances, which is a mixed kind of evidence, partly certain, and partly probable only. Under one or other of theſe heads, moſt kinds of probable evidence may be conveniently arranged. But for the particular illuſtration of each kind, I ſhall refer to the Philoſophy of Rhetoric, (B. I. c. 5.); to Beattie's Eſſay on Truth, (Part I. c. 2.); to Reid's Eſſays on the Intell. Powers, (Eſſay VII. c. 3.); or to Locke's Eſſay, (B. IV. c. 15. & 16.)

The form of a proof, or arrangement of arguments, may be either Analytical or Synthetical; the laſt is called reaſoning *a priori*; the firſt, reaſoning *a poſteriori.* The ſynthetical mode of proof, or reaſoning *a priori*, can be reſorted to only, when our firſt principles are clearly eſtabliſhed, and ſuch as, of themſelves, readily lead to important concluſions. The ſcience of mathematics affords the moſt copious examples of this mode of proof; as moſt of its demonſtrations proceed by fair deductions from its firſt principles, to the eſtabliſhment of new truths by ſynthetic reaſoning. All reaſonings concerning the exiſting properties of body and mind, it is now well underſtood, muſt firſt proceed analytically, ſo as to infer the primary laws by which they are regulated, from a careful compariſon of facts and obſervations. When, however, ſuch primary laws have been once legitimately eſtabliſhed, they may fairly be applied to new caſes, by the aid of *a priori* reaſoning. It is thus that, in mechanical philoſophy, it being once aſcertained that matter and motion are ſuſceptible of accurate meaſurement; the known properties of abſtract quantity are reſorted to for a foundation, upon which, by means of *a priori* reaſoning, new relations of matter and motion may be eſtabliſhed; and hence, in many inſtances, the evidence of phyſical inveſtigations comes to be the ſame as that of mathematical demonſtration. It ſhould always, however, be recollected, that *analysis* is the true mode of diſcovery, even in mathematics itſelf; and that *synthesis*, although frequently the moſt convenient mode of communicating knowledge, is not ſo properly calculated to increaſe its ſtores.

The invention of arguments, or the formation of new proceſſes of induction for the diſcovery of truth, is one of the nobleſt efforts of human genius; and is the eſſential requiſite of the truly philoſophic character. The degree of excellence in which this character exiſts, may be ſaid to depend chiefly upon the perfection in which it enjoys the faculties of Abſtraction, Combination, and Reaſon. By the firſt we are enabled to analyze the individual objects of nature; by the ſecond, we diſpoſe them into proper claſſes and aſſemblages; whence, by the agency of reaſon, we are enabled to deduce general laws or firſt principles. To conſtitute a preeminent ſcientific character, all the three faculties are required in perfection. Without ſound reaſoning, the analyſes and combinations of an ingenious mind, will be the mere vagaries of a heated fancy; and, without a facility at analyzing and compounding, we may, indeed, fully comprehend, and reap the benefit of the diſcoveries of others; but ſhall never, ourſelves, merit the praiſe of original invention.*

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* 'Alia ingenia aptiora ad notandas rerum differen'tias, alia ad ſimilitudines; utrumque labitur in ex'ceſſum, prenſando aut gradus rerum, aut umbras.' (*Nov. Org.* 55.)

The hiſtory of ſcience but too clearly evinces how apt reaſon is to be perverted, and to be led aſtray from the true path of diſcovery, by the influence of the imagination or the paſſions. We have no cauſe to ſuſpect that the geniuſes of antiquity were inferior in acuteneſs to thoſe of modern times: yet, of how little value are all their philoſophical ſpeculations, or, indeed, thoſe of any age, before the time of Lord Bacon! It is well known, that the merit of pointing out the only method by which real advances can be made in philoſophy, *viz.* the method of induction by analyſis, belongs excluſively to that great man; a truth which, however plain, had lain hid from all the philoſophers of former times, to the irreparable injury of their philoſophical ſpeculations.

Lord Bacon has alſo been very ſucceſsful in pointing out the common ſources of prejudice, or erroneous reaſoning, to which mankind are liable. Thoſe which he has denominated *idola*, or idols, he arranges under four claſſes. 1ſt, *Idola tribus*, or errors to which the whole human race are expoſed. 2d, *Idola ſpecus*, errors peculiar to certain individuals. 3d, *Idola fori*, errors ariſing from the abuſe of language; and, 4th, *Idola theatri*, errors belonging to particular philoſophical ſects. Theſe various ſources of error may be ſeen illuſtrated, both in the *Novum Organum*, and treatiſe *De Augmentis Scientiarum*; as alſo by Dr Reid, in Ch. VIII. of his 6th Eſſay on the Intellectual Powers; where a very ſatisfactory view is taken of the influence of theſe various prejudices on the ſcientific opinions of more modern times.

Mr Locke has alſo a very uſeful chapter on error, or wrong aſſent; of which he aſſigns four cauſes, *viz.* want of proofs, want of ability to uſe them, want of will to uſe them, and wrong meaſures of probability. (B. IV. c. 20.) It is the principal intention of the author of the preſent work, to cooperate, as far as he is able, in the detection of thoſe erroneous modes of reaſoning, by which the advancement of true ſcience is retarded. And here, the proper object of the undertaking, *viz.* the analyſis of the Intellectual Powers, may be conſidered as concluded; it has, however, been thought uſeful to ſubjoin, by way of illuſtration of the principles of reaſoning here recommended, an Appendix, containing a ſketch of the methods of inveſtigation peculiarly adapted to the various ſciences.

APPENDIX.

APPENDIX.

CHAPTER FIRST.

Of Mathematical Reaſoning.

THE ſcience of Mathematics has, from the remoteſt ages of antiquity, met with enthuſiaſtic admirers, and ſucceſsful cultivators. The peculiar ſimplicity and clearneſs of its firſt principles, the accuracy of its proofs, and the perſpicuity of its method, have juſtly conferred upon it a peculiar dignity in the ſcale of human knowledge, inſomuch, that its name (μαθησις) is that of *knowledge* or *ſcience* itſelf; and it is indeed the only branch of ſcience which is ſuſceptible of demonſtrative certainty in all its parts.

The cauſe of this peculiar certainty, and clearneſs of mathematical ſcience, is chiefly to be ſought in its almoſt total independence upon all human experience and obſervation. Thoſe ſciences which treat of the exiſting properties of body and mind, are evidently dependent upon obſerved facts and phenomena. Their ſimpleſt laws can be aſcertained only by a laborious compariſon of the individual caſes which are comprehended under them; and the experience and reſearch of ages is neceſſary to give to theſe branches of knowledge the conſiſtency of ſyſtem and legitimate theory. But the caſe is widely different with Mathematics; the materials upon which this ſcience operates are a few ſimple poſtulates, definitions, and axioms, which are determined without the aid of protracted experience, or laborious inveſtigation. By their aſſiſtance alone, without any aid derived from actual obſervation, it proceeds to eſtabliſh, ſtep by ſtep, its various propoſitions, gradually advancing from the ſimpleſt to the more complicated, till at length it arrives at the diſcovery of truths of the moſt remote and unexpected kind. Hence we find, that the ſcience of Mathematics made great and rapid advances among the ancients, while the various departments of philoſophy were never ſucceſsfully cultivated till theſe later ages.

We ſhall begin our view of the nature of mathematical reaſoning, with ſome obſervations upon the firſt principles of Mathematics, or rather of Geometry, *viz.* its axioms, poſtulates, and definitions. We have already obſerved, that thoſe axioms which are uſually called Mathematical, do not excluſively belong to the ſcience of Mathematics, but are in fact intuitive truths, diſcoverable by the faculty of reaſon, which are occaſionally, though tacitly, employed in every branch of knowledge. As theſe axioms are enumerated in the ſyſtems of Geometry, as, for example, in that of Euclid, they have, indeed, a mathematical form; but of this they might eaſily be diveſted, as has already been ſhewn, (c. 8. § 3.)

Neither is the enumeration of axioms given in the ſyſtems of Geometry by any means complete, or perfectly ſatisfactory. We have, in the above mentioned ſection, noticed ſeveral axioms omitted by Euclid, although tacitly referred to in his Demonſtrations, as that 'the 'whole is equal to all its parts taken together;' 'whatever is true of the genus, is true of all 'the ſpecies and individuals of that genus,' &c. Such omiſſions may be in ſome meaſure unavoidable. But it is an error of a more inexcuſeable kind in an elementary ſyſtem of Geometry, to claſs, with the axioms, truths which are not only not ſelf-evident, but even ſomewhat difficult of proof. Yet it has been acknowledged that Euclid has been guilty of this error in the caſe of his 12th axiom, which is ſo far from being a ſelf-evident truth, that it has coſt his commentators various theorems, ſupported by new axioms and definitions, properly to eſtabliſh it. Even the two which precede it, *viz.* ‘ two ſtraight lines cannot encloſe a ‘ ſpace ; ’ and ‘ all right angles are equal to ‘ one another ; ’ ſeem rather to be of the nature of corollaries, properly deducible from the definitions of a right line, and a right angle, than axioms ſtrictly ſo called.

I have already had occaſion to make ſome remarks upon what have been ſtated to be the axioms of arithmetic ; ſuch as, ‘ two and two ‘ make four ; ’ ‘ three and two are equal to ‘ four and one, ’ &c. (c. 8. § 3.) Theſe I have ſtated to be, not axioms properly ſo called, but either mere identical propoſitions, *i. e.* multiplied enunciations of the ſame truth, or concluſions of reaſoning, founded upon the real and legitimate axioms of Arithmetic. Theſe I conceive to be the very ſame as thoſe of Geometry ; ſuch as, that ‘ things which 'are equal to the ſame thing, are equal to one 'another;' 'if equals be added to equals, the 'wholes are equal,' &c.; with ſome additions ariſing from the peculiar nature of the ſcience of number; as that, 'if equals be 'multiplied by equals, the products will be 'equal;' 'if equals be divided by equals, the 'quotients will be equal;' and ſo on. Theſe axioms, it is evident, belong likewiſe to the ſcience of Algebra, which is only an univerſal or ſymbolical kind of arithmetic. The whole algebraic doctrine of the reſolution of Equations evidently depends upon the axioms juſt quoted, together with ſome others of a like kind; juſt as the primary rule of addition in arithmetic is entirely grounded upon this axiom, that 'the whole is equal to all its parts taken 'together.'

The *definitions* of Mathematics, which come next to be conſidered, have always been highly admired upon account of their peculiar clearneſs

neſs and certainty. They doubtleſs afford the moſt perfect ſpecimens of definition which we poſſeſs, and ought to be the models by which all attempts in this way ſhould be regulated. The cauſe of this peculiar clearneſs of mathematical definition, appears to be the ſame as the cauſe of the certainty of the reaſonings of the ſcience itſelf, *viz.* that its objects are not collected from actual obſervation, but are in a great meaſure the creatures of our own conceptions; ſo that we are able, by definition, to give full and adequate notions of the particular things treated of, which can ſcarcely be the caſe with the individual things of nature. 'A 'figure,' ſays Mr Locke (b. 3. c. 3. § 18.) 'including a ſpace between three lines, is the 'real, as well as nominal eſſence of a triangle; 'it being not only the abſtract idea to which 'the general name is annexed, but the very '*essentia* or being of the thing itſelf; that 'foundation from which all its properties flow, 'and to which they are all inſeparably annex-

'ed. But,' continues he, 'it is far other-'wiſe concerning that parcel of matter which 'makes the ring on my finger, wherein theſe 'two eſſences are apparently different. For it 'is the real conſtitution of its inſenſible parts, 'on which depend all thoſe properties of co-'lour, weight, fuſibility, fixedneſs, &c. which 'makes it to be gold, or gives it a right to that 'name, which is therefore its nominal eſ-'ſence.'

The objects of mathematical ſcience, however, though not real exiſtences in nature, are evidently founded upon our conceptions of ſuch exiſtences variouſly modified and abſtracted; for we never could have formed the notion of extenſion, which is the object of geometry, without the faculty of perception; nor of number, which is the object of Arithmetic, without the previous operation of memory, perception, or ſome faculty calculated to make us acquainted with the exiſtence of various individuals of a like kind. Hence we infer, that Mathematics is not abſolutely, though very nearly, an abſtract ſcience. To make this more evident by a particular inſtance: Euclid defines a circle to be ſuch a plane figure, that all ſtraight lines drawn from its centre to its circumference, are equal, (b. 1. def. 15.) If it be aſked how I come to believe, with certainty, that ſuch a figure may be formed? I think we muſt reſort to perception, or experience, for a ſatisfactory anſwer. We may have perceived a ſtretched thread to be fixed at one end, round which it is made to revolve, ſo as to deſcribe a circle; or the ſame thing to have been accompliſhed by a revolving rod; or, what is equivalent, a pair of compaſſes, a machine ſo contrived, as to have the ends alone of the line or rod applied upon the plane on which the circle is to be deſcribed. In all theſe methods, the diſtance between the centre and point which deſcribes the circumference, or the radius of the circle, has been virtually applied to every portion of the circle; and thus we get perceptive certainty of the poſſibility of the figure defined. Thus, the firſt principles of Mathematics reſt partly on the evidence of perception. But ſo few and ſimple are the references to this ſource, and ſo undoubted is their evidence, as almoſt to elude our notice; more eſpecially, as the faculty of Abſtraction has ſo large a ſhare in mathematical definitions, which never relate to extenſion as it is actually found in nature, but as it is mentally conceived in its ſeparate dimenſions; which are ſucceſſively treated of in Geometry, although in nature they are always, of neceſſity, found combined. *

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* The authority of Ariſtotle, it muſt be confeſſed, is in direct oppoſition to this doctrine of the ſenſes being, in ſome meaſure, concerned in the determination of the firſt principles of mathematical ſcience. 'It is evident,' ſays that philoſopher, 'that ſenſe is not concerned in this 'knowledge (of the theorems of Geometry). For if we 'could

The abſtractneſs of ſome mathematical conceptions has doubtleſs thrown conſiderable difficulties in the way of the learner; and on this account, as little metaphyſical ſubtilty as poſſible ſhould be admitted into the elementary parts of this ſcience. The very firſt definition of Euclid's Elements, *viz.* ' a point is that ' which hath no parts or magnitude,' has juſtly been objected to on account of its extreme abſtractedneſs, as well as on the more ſolid ground, that it contains only a negative, and is not convertible, as every good definition ought to be. To obviate this objection, various other definitions of a point have been propoſed,

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' could perceive by ſenſe, that the three angles of a tri' angle were equal to two right, yet ſhould we not reſt ' ſatisfied in this, but would yet ſeek after a demonſtra' tion of it; ſenſe reaching only to particulars, but know' ledge to univerſals.' Ουδε ἐπιϛασθαι δι αἰσθησεως ἐϛιν, ὅτι ϗ εἰ ἠν αἰσθανεσθαι, ὁτι το τριγωνον δυσιν ὀρθαις ἐχει τας γωνιας, ἐζητουμεν ἀν ἀποδειξιν ϗ οὐχ ὡς φασι τινες ἐπιϛαμεθα· αἰσθανεσθαι μεν γαρ ἀναγκη καθ᾽ ἑκαϛον, ἡ δε επιϛημη τῳ καθολου γνωριζειν ἐϛι.

poſed, of which the moſt unexceptionable appears to be that of Profeſſor Playfair, that ‘ a ‘ point has poſition, but not magnitude.’ It may ſtill, however, be doubted, whether the apprehenſion of a tyro be fully adequate to this abſtract and purely geometrical conception. To lead him, by gradual ſteps, and a kind of neceſſity, to the formation of this abſtract notion, might not the firſt definitions of the Elements of Geometry have been advantageouſly expreſſed as follows, ſetting out with that which can never be ſuperfluous, a definition of the objects of the ſcience itſelf?

Def. 1. Geometry is that ſcience which treats of the properties and relations of ſpace, or continuous quantity; which is exhibited under the various dimenſions of length, breadth, and thickneſs.

2. Magnitudes which have all the three dimenſions of length, breadth, and thickneſs, are called ſolids.

3. Magnitudes which have the two dimenſions of length and breadth, but are void of thickneſs, are called ſuperficies; and they are the boundaries of ſolids, and alſo their interſections one with another.

4. Magnitudes which have length only, and are void of breadth and thickneſs, are called lines; and they are the boundaries of ſuperficies, and alſo their interſections.

5. The boundaries, and alſo the interſections, of lines, are called points; which, therefore, have neither length, breadth, nor thickneſs, but merely poſition.

The criticiſms here offered on the firſt definitions of the Elements, relate merely to the attainment of perſpicuity, and accuracy of conception. There are ſome others, which I hope I may be allowed to make, without being accuſed of going beyond my proper province, which have a more material reference, as they tend to affect the value and utility of the definition itſelf, and the purpoſes to which it can be ſubſequently applied.

A good definition, according to the view of the ſubject which we have taken in Ch. VIII. § 4., ſhould contain an enumeration of certain ſimple characteriſtic attributes of the thing defined, by which it may be clearly diſtinguiſhed from all other things of a like kind. Simplicity requires, that as few particulars as may be, ſhould enter into the definition, and merely thoſe which are eſſentially requiſite to characterize the thing defined. In this reſpect, the definitions of Mathematics are, in general, peculiarly happy. They uſually contain ſome one ſimple, but characteriſtic property of the thing in queſtion, from which all its other properties may be readily and legitimately deduced. Thus, the equality of the radii of a circle, is the property of that figure aſſumed in its definition, from which all its other numerous properties are derived by the ſtricteſt reaſoning. Thus alſo, the equality of all the ſides of an equilateral triangle is aſſumed in its definition; from which is deduced the equality of its angles, and its other properties.

According to this view of the ſubject, a definition will be faulty, if the property aſſumed in it be not ſuch as is calculated naturally to lead to the demonſtration of the other properties of the thing defined; inſomuch, that ſome farther aſſumption may be requiſite before thoſe other properties can be legitimately eſtabliſhed. This fault may fairly be preſumed to exiſt in Euclid's definition of parallel lines, which he ſtates to be ſuch as, though infinitely produced both ways, do not meet, (B. I. def. 35.); becauſe, before proceeding to the demonſtration of any truth concerning theſe lines, he has found it neceſſary to aſſume a new property, evidently relating to them, and which conſtitutes what he calls the 12th axiom. It would lead me greatly too far from my preſent purpoſe, to enter into the detail of the difficulties to which this imperfection in the Elements has given riſe; or of the expedients which have been ſuggeſted for removing it. They may be ſeen at large in the commentaries which accompany the various editions of Euclid, particularly thoſe of Clavius, Simſon, and Playfair. Of the expedients which have been propoſed for obviating this imperfection, the moſt proper, in my apprehenſion, is a new definition of parallel lines; and I think it would not be very difficult to point out a definition, which ſhould be at once ſimple, and properly calculated to lead to the demonſtration of the various properties of thoſe lines.

Again, a definition appears to be faulty when it does not contain a diſtinct enunciation of any preciſe attribute of the thing defined, ſuch as is calculated to lead to the diſcovery and eſtabliſhment of its other attributes. To this cenſure, ſeveral of the definitions of Geometry,

metry, as given by Euclid, appear to be obnoxious. Such are, his definition of a ſtraight line, *viz.* ‘ that which lies evenly between its ‘ extreme points,’ (def. 4.); of a plane ſuperficies, *viz.* ‘ that which lies evenly between its ‘ extreme lines,’ (def. 7.); of a plane angle, *viz.* ‘ the inclination of two lines to one another, which meet, but are not in the ſame ‘ direction,’ (def. 8.); and perhaps ſome others; for it is impoſſible to deduce, by reaſoning, any one property of theſe figures from ſuch vague and indefinite deſcriptions of their nature.

Dr Simſon has ſubſtituted, in room of the above definition of a plane, one which contains a characteriſtic property of the thing defined, *viz.* ‘ that if any two points be taken in it, ‘ the ſtraight line between them lies wholly in ‘ the plane.’ He has, however, left the analogous definition of a right line juſt as he found it, although a correſponding correction was equally requiſite for it. We are indebted to the ingenious Boſcovich, (See his Treatiſe *De Lumine*) for a diſtinct illuſtration of the true geometrical conception of a right line; according to which, it is ſuch that, 'if it coincide 'with another right line in any two points, it 'muſt coincide with that line throughout its 'whole length.'

But the moſt faulty of the definitions above quoted, appears to be that of a plane angle, which, however, has been adopted with little variation by almoſt all ſubſequent geometricians. The ſtrange and paradoxical diſquiſitions which have been entertained concerning what is called *the angle of contact*, formed by the tangent of a circle, and the adjacent part of its circumference, are well known to mathematicians; and are to be found at large in Clavius's commentary upon Prop. XVI. b. 3. of the Elements. Theſe paradoxes ſeem to have no other foundation than the vague notion

tion of an angle, which is contained in Euclid's definition, and which ſpeaks merely of the *meeting* of the lines which form the angle; although every property of angles, which we find legitimately eſtabliſhed in Geometry, is evidently founded upon the ſuppoſed *interſection* of thoſe lines. All this mathematical ſophiſtry, therefore, would have been completely obviated, if Euclid's definition had informed us, that a plane angle is formed by the *interſection* of two lines, inſtead of their *meeting* with one another.*

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* I cannot help thinking, that much of the obſcurity and perplexity which is complained of in the Fifth Book of the Elements, or that which treats of the general properties of proportional quantities, ariſes from the want of a preciſe and ſatisfactory definition of geometrical ratio. For I cannot agree with thoſe writers who think, that this relation, on account of its ſimplicity, does not admit of being defined; although the definition given by Euclid, viz. that 'Ratio is a mutual relation of two magnitudes 'of

It is hoped that theſe protracted remarks upon the definitions of Geometry, will not appear ſuperfluous; ſince it may be gathered from the above illuſtrations, that an error in theſe definitions is calculated to produce material errors in the concluſions which are deduced from them. Remarks of a ſimilar kind might be extended to the definitions of the higher branches of Mathematics; but it may be deemed that I have already entered as minutely into this diſquiſition, as the plan of my undertaking will warrant. One further obſervation, however, I may be permitted to offer, *to wit*, that thoſe things which are aſſumed in the definitions of new branches of the Mathematics, ſhould never be inconſiſtent with the firſt aſſumptions of its purer elements. The method of *indivisibles*, as propoſed by Cavallerius, was manifeſtly

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'of the ſame kind to one another, in reſpect of quantity,' is evidently too vague to form the foundation of any ſubſequent inveſtigations.

manifeſtly liable to this objection, as it was aſſumed in it, that ſurfaces were made up of contiguous lines, and ſolids, of contiguous ſurfaces; in manifeſt contradiction to the firſt definitions of Geometry, which teach us, that a line has no breadth, and a ſuperficies no thickneſs. On this account, the method of indiviſibles was never conſidered as poſſeſſed of true geometric purity; and it has now happily given place to the much more unexceptionable, as well as infinitely more ingenious and uſeful, method of *Fluxions*.

With reſpect to thoſe firſt principles of Mathematics, called Poſtulates, it is not neceſſary to enter into any very minute detail. It is pretty plain, that their claim to ſelf-evidence is chiefly founded upon perceptive belief. For I know no other way in which we can be convinced that a line may be drawn between any two points,—that it may be indefinitely produced at pleaſure,—and that a circle may be deſcribed about any centre, and with any radius, than by an immediate reference to the ſenſes. Theſe are all the poſtulates which Euclid has expreſsly laid down as a foundation for his propoſitions. But the enumeration is not complete, any more than in the caſe of the axioms; for, in the courſe of the Elements, ſeveral other poſtulates are tacitly aſſumed. Thus, the demonſtration of the 4th Prop. of the 1ſt Book, proceeds upon the ſuppoſition that it is poſſible to apply one plane figure upon another, ſo as to make the parts of the one coincide with the correſponding parts of the other; and the various definitions of the 11th Book, evidently proceed upon the aſſumed poſtulate, that a plane may be made to revolve around one of its ſides as an axis. In the higher branches of the Mathematics, new poſtulates are in like manner aſſumed; thus, in the Conic Sections, it is aſſumed, that a ſolid, particularly a cone, may be cut by a plane in any required direction; and ſo forth.

If the firſt principles of mathematical ſcience, its axioms, poſtulates, and definitions, be fairly aſſumed, and accurately laid down, its inveſtigations may then be carried on according to the ſtricteſt laws of demonſtrative proof; for every ſtep of its deductions ſeems to conſiſt in the clear application of ſome neceſſary truth or axiom of reaſon. Let us examine how Euclid proceeds in the demonſtration of his firſt propoſition, ſo as neceſſarily to convince us that the triangle which he has conſtructed is really equilateral. It firſt follows, from his definition of a circle, that two ſides of his triangle are equal to one another; and, likewiſe, that the third ſide is equal to one of theſe two. To prove, therefore, the equality of all the three ſides, he has only to apply his firſt axiom, by which we are neceſſarily convinced, that 'things which 'are equal to the ſame, are equal to one an'other.' Here, therefore, the proof conſiſts ſolely in the application of an axiom.

The demonſtration of his ſecond propoſition contains no more than a ſimilar application of his 3d axiom; while, in its conſtruction, not only the poſtulates are made uſe of, as in the conſtruction of the firſt propoſition, but likewiſe the conſtruction of an equilateral triangle, now eſtabliſhed by means of this firſt propoſition; and the demonſtration of the 3d propoſition reſts, in like manner, upon a ſingle axiom, while, in its conſtruction, the 2d propoſition is employed. Again, the 4th propoſition, which is the *first* of the Theorems, is founded entirely upon the 10th axiom, and this other tacitly aſſumed one, that 'magnitudes, which may be made to coincide with 'each other throughout all their parts, are exactly equal to each other.' And in the demonſtration of the 5th, long as it is, no previous truth is applied except this 4th propoſition, and the 3d axiom; while, in its conſtruction, the 3d propoſition is employed.

Thus, the ſcience of Mathematics advances in its reaſonings, either by the application of its firſt principles, or of thoſe truths which it has already eſtabliſhed, to new caſes of an endleſs variety, till at length it arrives at the diſcovery of truths apparently the moſt remote from common apprehenſion. This ſucceſſive application of its eſtabliſhed truths to new caſes, is evidently nothing elſe than an exemplification of that axiom, or principle of reaſon, which teaches us, that what is true of a genus, is true of all the individuals comprehended under it; ſo that, in this caſe alſo, the proceſs of demonſtration conſiſts in nothing elſe than a particular application of an axiom, or neceſſary firſt principle. As this axiom conſtitutes the baſis upon which the demonſtrative evidence of the ſyllogiſtic mode of reaſoning reſts, we perceive the truth of an obſervation, which has been frequently made, that every demonſtration, particularly every mathematical demonſtration, may be turned into a ſeries of ſyllogiſms.

The demonſtrations of Geometry, particularly thoſe of its elements, are always given in the ſynthetical form, as regularly deducible from its firſt principles, and from one another. It muſt, however, be recollected, that the proper method of diſcovery, even in Geometry, is not Syntheſis, but Analyſis. That the ancient geometricians poſſeſſed a method of analyſis, which they highly prized, and which was ſyſtematically taught in various ſeries, or books of geometrical propoſitions, is a fact well known to Mathematicians; although conſiderable uncertainty prevails as to the preciſe nature of this boaſted method. This much, however, is certainly known, that the general principle upon which the ancient analyſis proceeded, was, to take for granted the truth to be proved, and deduce therefrom a legitimate ſeries of concluſions, until theſe ſhould terminate in ſome ſelf-evident, or previouſly aſcertained truth. This proceſs, when reverſed, became a ſatisfactory ſynthetic demonſtration of the uſual kind; and it is evident, that the principles by which our belief in the certainty of both kinds of reaſoning is regulated, are preciſely the ſame.

It cannot, however, be denied, that mathematical demonſtrations may be, and frequently are, diſcovered by ſyntheſis, as well as by analyſis, although the latter method is beſt calculated for the purpoſes of diſcovery. One reaſon of this appears to be, that the concluſion of a propoſition is one ſimple aſſertion, while the premiſes generally conſiſt of two or more ſeparate aſſumptions. While, therefore, we proceed to reaſon from the premiſes to the concluſion, we are liable to be bewildered by the multiplicity of paths which offer themſelves to us; but if we reverſe this method, the road is uſually ſimple, and may lead us to many different concluſions, all of which are calculated to prove the truth of our propoſition.

But human ingenuity will make diſcoveries in Mathematics, as well as in other ſciences, by methods which are neither ſtrictly analytical, nor ſynthetical. Dr Wallis, it appears, was accuſtomed to infer a general truth merely from obſerving it to take place in a variety of inſtances; and, by this kind of induction, he diſcovered many of his moſt curious propoſitions. The great field of mathematical diſcovery has, in modern times, been chiefly confined to the ſcience of Algebra, in which the method of diſcovery has the peculiar advantage of being purely analytical. In this ſcience, although the ſolution of problems, of the more difficult kinds, doubtleſs demands a large portion of ingenuity; yet ſo happy are the expedients which it poſſeſſes, and ſo preciſe the rules of its analyſis, that, in ordinary caſes, a common underſtanding is ſufficient for overcoming the difficulties of a queſtion. Hence, in the preſent advanced ſtate of the mathematical ſciences, we find the province of Geometry uſually limited to the demonſtration, by a legitimate ſyntheſis, of thoſe truths which may have been brought to light by the happier expedients of algebraic analyſis.

CHAPTER II.

Of the Induction of Physical Science.

WHILE the ſcience of Mathematics was advancing towards a ſtate of high maturity, and had given birth to the immortal works of Euclid, Archimedes, and Apollonius, as well as to the more refined and abſtracted inveſtigations of the algebraic analyſis, the ſcience of Phyſics was yet in its infancy. The ſmall progreſs made in phyſical ſcience by the ancient Greeks, as well as by the Romans, who, in matters of ſcience and literature, were only the imitators of the Greeks, is to be aſcribed, partly to the peculiar genius of the people, partly to the manner in which they conducted their ſcientific inveſtigations.

The Greeks were a nation, as Newton expreſſes it, 'magis philologica quam philoſo-'phica;' more fitted to excel in elegant literature, and the cultivation of the fine arts, than in the ſeverer inveſtigations of philoſophical ſcience. Indeed, in ſome reſpects, it may be ſaid, that the knowledge of nature rather declined, than advanced in the ſchools of Grecian philoſophy. We have good reaſon to believe, that Pythagoras imported into Greece the true ſyſtem of the univerſe, which repreſents the ſun as the centre of the planetary motions. Yet, immediately after, it was taught by Anaxagoras, Democritus, and others, that the earth is fixed immoveably in the centre of the univerſe; a doctrine which, being afterwards variouſly modified by Eudoxus, Ptolemy, and others, became the prevailing aſtronomical ſyſtem of the Greeks.

The manner in which the Greeks endeavoured to cultivate the ſcience of Phyſics, was by no means calculated effectually to anſwer that end. Enamoured of mathematical ſpeculations, and of the certainty, elegance, and ſimplicity of geometrical proof, they ſeem to have wiſhed to introduce into phyſical reſearch the ſame ſimplicity of principle, and elegance of arrangement. Not aware that all knowledge of the phenomena of nature muſt reſt upon the baſis of experience, and accurate obſervation, they attempted to eſtabliſh a ſyſtem of phyſical ſcience by a ſynthetic deduction from a few aſſumed general principles, inſtead of by a careful analyſis of the varied appearances which nature exhibits.

The philoſophical ſpeculations of Ariſtotle, the moſt admired of all the ancients for his ſcientific acuteneſs, afford a remarkable example of this truth. He offers to the world an arrangement, or claſſification, of all the objects of human knowledge, or every thing that can form a ſubject of our thoughts, paſt, preſent, and to come, comprehended under ten general heads, or categories. He then proceeds to inquire what might be aſſerted, or (according to the ſcholaſtic language) *predicated*, of ſuch general conceptions as the categories; and, having done this, by the aid of abſtract reaſoning, little more remained to complete the Ariſtotelian ſyſtem of philoſophy, than to arrange, under their proper categories, the various individual things of nature. For the *Organon*, or *Logic* of Ariſtotle, after a moſt laborious inveſtigation, eſtabliſhes this truth, that whatever is predicable of a genus, is likewiſe predicable of all the ſpecies of that genus; which ſelf-evident principle is the great reſult of all the ingenuity that has been beſtowed by the Ariſtotelians on the ſyllogiſm and its various figures and modes. In the arrangements of the genera and ſpecies of the categories, however, the followers of Ariſtotle have differed very widely from one another, and have amply evinced the unſteadineſs of the light by which they were guided, when they no longer ſervilely followed the footſteps of their great archetype.

The Ariſtotelian philoſophy, like all the other ſyſtems of the ancient ſchools, contained a ſufficient ſhare of arbitrary aſſumption and viſionary hypotheſis. It was a rule with its followers, never to decline the ſolution of any phenomenon that might be propoſed to them; and the impoſing terms of *substantial forms*, *materia prima*, *generation*, *corruption*, *privation*, &c. were offered and received as ſatisfactory philoſophical explanations of natural appearances. The learned jargon, and demonſtrative ſolemnity, in which this ſyſtem was enveloped, ſeems to have conſpired, with the real acuteneſs and ingenuity occaſionally diſplayed by its founder, in acquiring to it a reputation, and an extenſive reception, unequalled before in the hiſtory of ſcience.

The Ariſtotelian philoſophy was carried by Alexander the Great into Aſia; by his ſucceſſors into Egypt; and it found its way to Rome, after Greece became a province of the empire. It was adopted by the Jews, by the Fathers of the Chriſtian church, by the Mohammedan Arabs during the Caliphate, and continued to be cultivated by the ſchoolmen through all Europe, until the enlightened æra of the ſixteenth century. At this remarkable period, deſtined to give birth to a reformation both in religion and philoſophy, the illuſtrious Bacon, Lord Verulam, aroſe, whoſe ſuperior genius clearly perceived the futility of what was then called knowledge, and prompted him to explore a more certain path for the proſecution of this deſirable object. To him we owe two immortal treatiſes: the firſt 'De augmentis Scientiarum,' and the ſecond the 'Novum Organum;' which have for their object, nothing leſs than to reform the ſyſtem of human learning, and to point out the true and legitimate mode of ſcientific inveſtigation. *

Rejecting the ſyllogiſtic mode of reaſoning, which he juſtly repreſents as a mere inſtrument of ſcholaſtic diſputation, and altogether incapable of advancing in the real knowledge of nature, Bacon propoſes to ſubſtitute, in its room, the method of analytical induction; according to which, natural phenomena are ſubjected to the teſt of obſervation and diligent inveſtigation, in order that known facts may furniſh a ſure foundation for general truths. He then points out phyſical experiment as the true *organ*, or inſtrument, by which diſcoveries in nature can be accompliſhed, and as the only effectual method of drawing men off from thoſe uncertain ſpeculations which contribute nothing towards diſcovering the true nature of things. He utterly rejects hypotheſis and conjecture, as the means of ſolving natural phenomena; he ably illuſtrates the various prejudices, or errors (called by him *idola*) to which the human intellect is more peculiarly obnoxious; and happily ridicules the veneration for ancient names which had ſo long prevailed in the world. If, ſays he, age and experience entitle to the name of ancient, we, who live in the fartheſt advanced period of the world, and have the advantage of the obſervations of all who have gone before us, are to be called the ancients, and to have our opinions, at leaſt in matters of ſcience, treated with the greateſt reſpect.

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* 'Fruſtra expectatur augmentum in ſcientiis ex ſuperinductione novorum ſuper vetera, inſtauratio facienda eſt ab imis fundamentis, niſi libeat perpetuò circumvolvi in orbem cum exili et quaſi contemnendo progreſſu.' (*Nov. Org. lib.* 1.)

It was too much, however, to expect that the precepts of Bacon, however judicious, ſhould at once overthrow a ſyſtem of error, which had the accumulated authority of ages to ſupport it. Many phyſical inquirers, indeed, were ſagacious enough to diſcover, that experiment and analytical induction were the only certain means of advancing the knowledge of nature. Such were the celebrated Roger Bacon, who flouriſhed in the beginning of the thirteenth century; Gilbert of Colcheſter, who wrote immediately before Lord Verulam; Galileo, one of the principal ornaments of this illuſtrious æra of ſcience; Mr Boyle, who made his philoſophical experiments not long after, and ſome others. But the paſſion for hypotheſis, and ſynthetic reaſoning, was by no means extinguiſhed; and was deſtined, ſoon after, to receive a powerful ſanction from the example of the ingenious Deſcartes; who ſeems to have been actuated by the ambition of founding a ſect, in that ſcience which properly diſclaims all ſects, and admits of no other authority than nature herſelf. *

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* 'De tous les philoſophes,' ſays Condillac, 'le 'Chancelier

At the preſent advanced period of philoſophical ſcience, we cannot help wondering at the general reception, and unbounded applauſe which the phyſical ſyſtem of Deſcartes experienced; when it is evident, that its whole fabric of *materia subtilis*, *absolute plenum*, *rotatory particles*, and *vortices*, had no other foundation than in the reveries of his own lively imagination. This ſhould teach us an uſeful leſſon

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'Chancelier Bacon eſt celui qui a le mieux connu la 'cauſe de nos erreurs. Il a vu que les idées qui ſont 'l'ouvrage de l'eſprit, avaient été mal faites, et que par 'conſequent pour avancer dans la recherche de la verité 'il fallait les refaire. Mais pouvait-on l'écouter? Pre'venu comme on l'etoit pour le jargon de l'école ou pour 'les idées innées ne devoit-on pas traiter de chimérique 'le projet de renouveller l'entendement humain? Bacon 'propoſait une méthode trop parfaite pour être l'auteur 'd'une révolution. Deſcartes devait mieux réuſſir, ſoit 'parce qu'il laiſſait ſubſiſter une partie des erreurs, ſoit 'parce qu'il ne ſemblait quelquefois en détruire, que 'pour en ſubſtituer de plus ſeduiſantes.' (*Art de Penser*, at the end.)

leſſon of caution, againſt implicitly admitting any new ſyſtem of ſpeculation, however ingeniouſly conſtructed, or generally admired.

But the period was at hand, when the true mode of inveſtigating nature was ſo admirably illuſtrated and exemplified, as to render it impoſſible that it ſhould afterwards be wholly overlooked in the ſpeculations of ingenious men. This ineſtimable ſervice to ſcience was performed by the immortal Newton, of whom it may ſafely be ſaid, that during the period of his, fortunately, long life, he did more in elucidating the phenomena of nature, and communicating ſound and important knowledge to mankind, than has been done by the collective labours of all the natural philoſophers that have preceded or yet followed him. Bacon, indeed, had the merit of firſt inculcating the true principles of phyſical inveſtigation; but it was left for Newton to prove to the world what wonderful diſcoveries might be made, by ſtrictly adhering to the rules of analytical induction; and to fix more preciſely, both by precept and example, than had ever been done before, the true laws of philoſophizing.

According, then, to the principles of what is now generally called the Newtonian philoſophy, the object of the ſcience of Phyſics, is to make us acquainted with the various phenomena of nature, and their general laws. Theſe phenomena are made known to us, in the firſt inſtance, by the evidence of ſenſe alone; which is, therefore, to be looked upon as one of the firſt principles, or foundations, of the ſcience of Phyſics. Another firſt principle of this ſcience is, the conviction which all men have of the ſteady recurrence of natural phenomena; or that, in the events of nature, the future will reſemble the paſt; of which conviction I have already endeavoured to aſſign the origin, (Ch. VIII. § 3.) Theſe natural phenomena, or events are, on the one hand, to be diſtinguiſhed ed from the works of art, and, on the other, from preternatural or miraculous appearances. Thus, the ſigure of a houſe, or a chair, is not a natural phenomenon; though that of a tree, or an animal, is: and, when I move a body with my hand, its motion is not a natural phenomenon, although, when it is thrown into the air, its path, after it goes out of my hand, is a natural phenomenon. Again, if a piece of iron ſinks in water, this is a natural phenomenon; but, if it is made to ſwim in that fluid, by the immediate interpoſition of Divine power, this is not a natural phenomenon, but a miracle.

The phenomena of nature, as they are exhibited to our ſenſes, are of an almoſt endleſs variety and complication. To acquire a knowledge of them all, individually, is therefore manifeſtly impoſſible; and it is only by the help of arrangement and claſſification that we are enabled to form an acquaintance with their general nature. Aided by patient inveſtigation, we find out points of reſemblance in phenomena, which, in various reſpects, diſagree; we aſcertain whether the diverſity be permanent, or only accidental; and, if it be the latter, we conſider the phenomena as, in fact, reducible to the ſame claſs. Thus, the cultivation of the ſcience of Phyſics, enables us gradually to generalize, or to advance from the knowledge of particulars to that of generals; and, when we can no farther thus aſcend, we give to that ultimate phenomenon, which conſtitutes the claſs to which a variety of ſubordinate appearances have been referred, the name of a *law of nature.*

To illuſtrate this analytical proceſs, let us take, for an example, the inveſtigation of any one general law of nature, as, for example, *Gravitation.* From time immemorial it has been obſerved, that heavy bodies naturally fall towards the earth; but it was reſerved for

Galileo to inveſtigate the particular laws by which this deſcent is regulated, and to ſhew, that the velocity of the falling body is uniformly accelerated, and the ſpaces it deſcribes, regularly as the ſquares of the times. This illuſtrious philoſopher likewiſe demonſtrated, that the oblique path of a projectile, which is acted upon by the force of projection, and the tendency to deſcend, conjointly, is the preciſe curve of a parabola. The heavenly bodies, during their mutual approaches to each other, may be contemplated in the light of deſcending, or falling bodies; but this ſpeculation was reſerved for another genius, and another age. Meanwhile, Kepler, a Pruſſian aſtronomer, diſcovered, by means of patient obſervation and compariſon, certain laws by which the planetary motions are regulated. He found, that theſe bodies all move in ellipſes; that the areas they deſcribe are proportional to the times of deſcription; and, that the ſquares of the periods of their revolutions, are as the cubes of their diſtances from the point about which they revolve. This advance in generalization, was the ſole fruit of cloſe obſervation; but the immortal Newton was able afterwards to demonſtrate, that Kepler's laws were neceſſarily true of every body made to revolve in a regular curve, by the joint action of a projectile force, and a central power; ſuch, that it diminiſhed in intenſity as the ſquare of the diſtance from it increaſed. This alſo was known to be the law of that power by which a ſtone is made to fall towards the earth; at the ſame time that the peculiar deflections of the planets were ſhewn, by Newton, preciſely to accord to the ſame general principle. Thus was eſtabliſhed, upon the ſureſt baſis, the Newtonian theory of *Universal Gravitation*; a theory, of wonderful extent and importance in explaining the phenomena of nature. Subſequent philoſophers have attempted ſtill farther to generalize; and to ſhew, that this widely extended principle, thus unfolded by Newton, is included in another ſtill more general, *viz.* that of *Impulse.* They aſcribe the motions of the planetary bodies, as well as of thoſe which are attracted by the earth, to the impulſe of a certain inviſible fluid, which they call Ether, and which they ſuppoſe to be every where preſent, moving in all directions. But, beſides that it has never yet been demonſtrated, that the motions of ſuch a fluid are ſuited to produce the viſible effects of gravitation; it is manifeſtly contrary to the ſpirit of the true, or Newtonian, philoſophy, to aſcribe phenomena to the agency of an element whoſe exiſtence is not proved, but taken for granted. In this farther ſtep of generalization, then, we are as yet unwarranted to proceed, without departing from the principles of true philoſophy. *

Thus, it appears, that the true object of the ſcience of Phyſics is, to arrange the phenomena na of nature under a certain number of general claſſes, which conſtitute the laws of nature, and are to be conſidered as ultimate facts, or firſt principles, till, by a farther progreſs in analytical inveſtigation, we are able to diminiſh their number, and reduce the phenomena comprehended under one general law, to the claſs which conſtitutes another general law. While we thus reduce a new phenomenon to that law of nature to which it properly belongs, we are ſaid, in common language, to aſſign its cauſe. Thus, Newton is ſaid to have diſcovered that *gravitation* is the *cauſe* by which the planets are retained in their orbits, while they revolve round the ſun. We muſt, however, carefully keep in mind, that the term *cauſe*, taken in this ſenſe, imports ſomething very different from that *active energy* which we are led to believe is neceſſarily concerned in the production of every natural phenomenon. However firmly we may be convinced of the reality of ſuch active and efficient cauſes, candour obliges us to acknowledge our ignorance of their nature and mode of operation. The ancient philoſophical ſects, indeed, made no ſcruple in giving their ſentiments on this difficult ſubject; and much of the philoſophy of Pythagoras, of Plato, and of Ariſtotle, conſiſts in ſpeculations concerning the agency of ſpiritual eſſences, of departed ſouls, of demons, or of the univerſal ſoul of the world, in producing the various changes of nature. The Newtonian philoſopher, however, has wiſely diſmiſſed ſuch ſpeculations from its phyſical inveſtigations; and profeſſes merely to inveſtigate the general laws of natural events, and to apply theſe to the explanation of particular phenomena. If, indeed, we adopt the language of the vulgar, and ſuppoſe a conſtantly preceding event to be the cauſe of that which immediately follows it, then, we may ſtill conſider Phyſics as the ſcience of *cauſes*; but of the active and efficient cauſes of phenomena, it, in ſtrict propriety, takes no cognizance.

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* See Æncyclop. Britan. Articles PHILOSOPHY and PHYSICS.

The reality of this diſtinction is admirably illuſtrated by Dr Reid, in his Eſſays on the Active Powers of Man. (Eſſay I. c. 6.) Among other excellent remarks, it is there ſaid, that ' the whole object of natural ' philoſophy, as Newton expreſsly teaches, is ' reducible to theſe two heads; firſt, by juſt ' induction, from experiment and obſervation, ' to diſcover the laws of nature; and then to ' apply thoſe laws to the ſolution of the phe- ' nomena of nature. This was all that this ' great philoſopher attempted, and all that he ' thought attainable. And this, indeed, he ' attained, in a great meaſure, with regard to ' the motions of our planetary ſyſtem, and with ' regard to the rays of light. But ſuppoſing ' that all the phenomena that fall within the ' reach of our ſenſes, were accounted for from ' general laws of nature, juſtly deduced from ' experience, that is, ſuppoſing natural philoſo- ' phy brought to its utmoſt perfection, it does ' not diſcover the efficient cauſe of any one 'phenomenon in nature. The laws of nature 'are the rules, according to which the effects 'are produced; but there muſt be a cauſe 'which operates according to theſe rules. The 'rules of navigation never navigated a ſhip. 'The rules of architecture never built a 'houſe. Natural philoſophers, by great at'tention to the courſe of nature, have diſco'vered many of her laws, and have very hap'pily applied them to account for many phe'nomena; but they have never diſcovered the 'efficient cauſe of any one phenomenon; nor 'do thoſe who have diſtinct notions of the 'principles of the ſcience, make any ſuch pre'tence. Upon the theatre of nature we ſee 'innumerable effects, which require an agent 'endowed with active power; but the agent 'is behind the ſcene. Whether it be the 'Supreme Cauſe alone, or a ſubordinate cauſe, 'or cauſes; and, if ſubordinate cauſes be em'ployed by the Almighty, what their nature, 'their number, and their different offices may

‘ be, are things hid, for wiſe reaſons, without ‘ doubt, from the human eye.’

It is ſufficiently evident, from what has been ſaid, that the mode of inveſtigation which is calculated to advance the ſcience of Phyſics, is eſſentially different from that which is ſuited to Mathematical ſcience. The induction of Phyſics is a pure analyſis, aſcending from obſerved facts and phenomena, to the diſcovery of their general laws, or principles; the induction of Mathematics, although it may, for the ſake of convenience, aſſume the analytical form, yet admits of being carried on by a ſtrict ſynthesis, or reaſoning *a priori*, from its firſt principles. The truths of Phyſics can be gathered only from a long continued experience; but thoſe of Mathematics are deduced, by the powers of reaſoning alone, from the ſimple firſt principles of the ſcience, without any reference to experience. Yet, when once general laws, or principles, are eſtabliſhed in phyſical ſcience, theſe may be advantageouſly applied to the elucidation of particular phenomena by ſtrict ſynthetical reaſoning. Thus, Galileo, finding that a projectile is acted upon by the two forces of gravitation and impulſe, whoſe laws he had previouſly eſtabliſhed, was able to demonſtrate, ſynthetically, that it muſt deſcribe the preciſe curve of a parabola. In theſe, and other caſes of phyſical inveſtigation, the very form of mathematical proof is advantageouſly employed, upon the conſideration, that the various relations of matter and motion, to which many natural phenomena are reducible, admit of accurate meaſurement and calculation.

As phyſical ſcience conſiſts in aſcribing particular phenomena to their proper general laws, it is evident that the certainty of our deductions in this ſcience, will depend upon the juſt application of that principle of reaſon, which leads us to aſſert of every ſpecific thing, that which is true of its comprehending genus; a principle or axiom which we have already ſeen to be of the moſt frequent employment in mathematical ſcience. In Mathematics, however, if the juſt method of inveſtigation be followed, there can be no room for doubting that this principle is fairly applied. But in Phyſics we have by no means the ſame certainty upon all occaſions; becauſe, though two phenomena may agree in all the circumſtances which have come under our obſervation, they may yet differ in others, of which we are ignorant, and therefore, may be improperly reduced to the ſame general law. In many inſtances, however, the points of reſemblance may be ſo numerous, as to remove all ſhadow of doubt concerning the identity of the general principle; as in the caſe of the planetary motions, which Newton has demonſtrated to be regulated by the ſame law which cauſes a ſtone to fall to the earth.

Thus, Phyſics can only be called a probable ſcience, although, in a great many inſtances, attaining to certainty. The cauſes of error in this ſcience, according to the view we have taken of the ſubject, can ariſe only, either, 1ſt, From the falſe aſſumption of phenomena, and the ſtatement of thoſe things to be facts, which have no real foundation in nature; or, 2d, From arranging facts improperly, under claſſes to which they do not belong.

The firſt of theſe ſources of error, the falſe aſſumption of phenomena, is, in general, much eaſier of detection than the laſt. It was, indeed, very fruitful in falſe philoſophy, before the proper method of cultivating phyſical ſcience was underſtood; and the principal phyſical ſyſtems of the ancients, contain little elſe than abſurd hypotheſes, inſtead of a detail of the actual phenomena of nature. Such is the aſſertion of Heraclitus, concerning the cylindrical figure of the earth; the doctrine of Calippus, that the celeſtial ſpheres are formed of cryſtal; Ariſtotle's dogmas concerning ſubſtantial forms; and ſo forth. In fact, till the time of Newton, who firſt ſucceſsfully demonſtrated the inefficiency of reaſoning from hypotheſes in Phyſics, the ſame ſource of error continued to be very prevalent among the moderns. Thus, the whole phyſical ſyſtem of Deſcartes is grounded upon the aſſumption, that the univerſe originally conſiſted of nothing more than a ſet of cubes of matter, whirled about with a certain degree of rapidity. Leibnitz grounds his philoſophy upon the hypothetical exiſtence of a ſet of original particles of matter, of a peculiar kind, which he calls *monads*: other philoſophers have aſſigned different qualities to theſe conſtituent particles, and called them *atoms*: But all the while, the exiſtence of the atoms, the monads, and the Carteſian cubes, reſts upon no other evidence than mere hypotheſis.

At preſent, experience has rendered us

more cautious in this matter; and if ingenious men are ſtill prone to indulge in conjecture where facts are wanting, others are by no means inclined to miſtake ſuch hypothetical reveries for ſound philoſophy, but aſk for facts fully inveſtigated and cautiouſly aſcertained, as the baſis of phyſical reaſoning and theory.

Oppoſite to the admiſſion of phenomena, which have no real exiſtence in nature, is the rejection of thoſe which are grounded upon ſufficient evidence; a ſource of error chiefly confined, at leaſt in modern times, to thoſe philoſophers called Sceptics. Thoſe perſons pretend to queſtion the evidence of their ſenſes, of their memory, or of their conſciouſneſs; by the teſtimony of which the rational part of mankind have been guided in the regulation of their moſt important concerns in all ages of the world. In lieu of the irreſiſtible conviction which thoſe faculties bring along with them, they are diſpoſed to ſubſtitute the proofs afforded by their own ſophiſms; which exhibits an inſtance of one of the ſtrangeſt paralogiſms, or an admiſſion of the leſs evident, in lieu of the more convincing, to be found in the records of ſcience. But we have already had repeated occaſion to expoſe the futility of ſuch ſophiſtry; and it is indeed the principal object of an inquiry like the preſent, to detect its abſurdity, and to place upon their proper foundation thoſe firſt principles of the different branches of knowledge which we derive from our various intellectual faculties.

The ſecond general ſource of error in phyſical ſcience, above ſtated, is a wrong claſſification of phenomena, or the aſſigning to the ſame law of nature phenomena which, in fact, belong to different laws. This is a cauſe of error, doubtleſs, very difficult to be avoided, and that which will, probably, always continue to render phyſical ſpeculations in ſome degree uncertain. Even when natural laws appear to be very firmly eſtabliſhed, new facts may be diſcovered, which ſhall alter our opinions concerning them. Thus, there are not wanting thoſe who wiſh to ſubſtitute another explanation of the tides, in room of that aſſigned by the immortal Newton, *viz.* gravitation. With more reaſon, perhaps, do we find his theory of the rectilineal courſe, and materiality of the particles of light, ſtill oppoſed by thoſe who eſpouſe the Carteſian hypotheſis, of an etherial luminous fluid. In other caſes, the ground of diſſent is far more ſubſtantial. Thus, chemiſts are at preſent divided in opinion, whether the phenomena of heat are to be aſcribed to the agency of a peculiar fluid, according to the ſyſtem of Boerhaave, which has been ſo ſtrongly ſupported by the experiments of modern chemiſts; or may be accounted for by the mere ſpecific action of the particles of body; a doctrine which is ſanctioned by the illuſtrious names of Boyle, Bacon, and Newton, and ſeems at preſent to be gaining ground with chemiſts of reputation. Again, although the Franklinian theory of a ſingle electric fluid, exiſting ſometimes in a redundant, ſometimes in a deficient ſtate, is that which is moſt generally admitted in the ſyſtems of electricity; yet there are not wanting many electricians, who think the phenomena of their ſcience better explained by the ſuppoſition of two electric fluids of oppoſite qualities, ſometimes exiſting in a ſeparate and perceptible form, ſometimes in a ſtate of inactive combination.

Theſe facts ſhould induce us to be cautious how we admit, as certain, explanations of natural phenomena, which future diſcoveries may overturn; and ſhould lead us to examine, with the moſt ſcrupulous attention, all the points of apparent identity and diverſity among thoſe phenomena which we claſs together. For it is the natural tendency of the human mind to ſeek for points of analogy where none really exiſt; and to endeavour to reduce, to a few general principles, all the facts which come within the ſphere of its obſervation.

CHAPTER THIRD.

Of the Induction of Metaphyſics and other Sciences.

After the full diſcuſſion which has been beſtowed upon the nature of phyſical induction, it will not be neceſſary to make many obſervations upon the peculiarities of the induction adapted to Metaphyſics, or the philoſophy of mind. It may, indeed, be truly ſaid that the ſciences of Phyſics and Metaphyſics differ much more from each other in the peculiar nature of their objects, than in the mode according to which they ought to be cultivated; and occaſion has already been furniſhed, more than once in the courſe of this work, to detail the principal rules by which metaphyſical inveſtigation ſhould in general be regulated.

The ſcience of Metaphyſics, like Phyſics, can be ſucceſsfully cultivated only by a ſtrict and cautious analyſis. Both ſciences muſt commence with a collection and examination of facts and phenomena, which come, by degrees, to be digeſted and arranged under certain general laws. But the ſources from which the facts are derived, are widely different in theſe two branches of ſcience. It is from the ſenſes that we derive this information in the caſe of Phyſics; while, in the caſe of Metaphyſics, the fundamental facts are derived from the evidence of Conſciouſneſs; or from a knowledge of the conduct of other men, as exhibited in the world; or as detailed in the records of hiſtory, voyages, travels, &c.; or to be gathered from the annals of philoſophy and the arts, or an examination of the ſtructure of language; all of which throw light upon the conſtitution of the human mind, to which they owe their ſource.

It is evident, that as metaphyſical ſcience, like phyſical, conſiſts in arranging particular phenomena under their proper general laws, the certainty of its deductions, likewiſe, will depend upon the juſt application of that axiom, which teaches us, that what is true of a genus or claſs, is true of all the individuals comprehended under it. The uſual cauſes of error in this ſcience alſo, as in Phyſics, will be, either the falſe aſſumption of facts and phenomena; or the arrangement of theſe under claſſes to which they do not properly belong.

The firſt of theſe cauſes of error has been as fruitful of abſurd ſpeculation in Metaphyſics, as in Phyſics. Witneſs the ſtrange conſequences that have been deduced from the celebrated hypotheſis of ideas, or images of things preſent in the brain, as variouſly modified in the ſyſtems of ancient and modern philoſophers. Other inſtances of a like kind are to be found in Hartley's hypothetical ſyſtem of the vibrations and vibratiuncles of the fibres of the brain and nerves; in the various hypotheſes which philoſophers have offered concerning the immediate ſeat of the ſoul, or ſentient principle; and ſo forth. Indeed, ſo few perſons are qualified, from their peculiar habits, or purſuits, to pay a diligent attention to the information to be derived from Conſciouſneſs, the moſt inſtructive ſource of information in intellectual ſcience, that we ought to be ſcrupulouſly on our guard in admitting what are ſtated as new phenomena in this branch of knowledge; and ſhould cautiouſly weigh the evidence, according to which they are to be received or rejected.

We are, perhaps, leſs liable to miſtake in Metaphyſics, than in Phyſics, from the ſecond general cauſe of error, *viz.* the wrong claſſification of phenomena; becauſe all the phenomena exhibited by a human being are much more completely within the compaſs of our obſervation, than all the varied phenomena of the material world; ſo that we can more certainly aſcertain the points of reſemblance, or diverſity, which occur among the former, than thoſe which obtain among the latter.

Yet, in metaphyſical ſcience, as well as in phyſical, an inordinate deſire of ſimplicity, or a deficiency of obſervation, will occaſion a wrong claſſification of phenomena. Thus, the ethical ſyſtem, which was ſupported by Epicurus among the ancients, and by Hobbes, Mandeville, and others among the moderns, repreſents *ſelf-love* as the ſole active principle by which man is prompted in his conduct, whether he ſeeks his own good, or the good of his neighbours. But this doctrine directly oppoſes the evidence of Conſciouſneſs, which very plainly informs us, that there is a principle of benevolence in man, as well as a principle of ſelfiſhneſs. Again, many Pneumatologiſts have treated of Taſte as a peculiar and original faculty of the human mind, by the operation of which we derive gratification from contemplating certain objects, or qualities, which are denominated, *sublime*, *beautiful*, &c. But in the farther progreſs of Pneumatology, it ſeems to have been eſtabliſhed, that ſuch objects are not gratifying on account of any peculiar characteriſtic qualities which they poſſeſs in common, but becauſe they are ſuited to excite certain pleaſing emotions in the mind. Thus, ſublime objects ſeem all to agree in exciting a pleaſing kind of awe, or gentle terror, (See Burke on the Sublime and Beautiful); and beautiful objects are calculated to excite affection, by their expreſſion of delicacy or tenderneſs, (See Aliſon on Taſte.) Hence, it becomes no longer neceſſary to refer to the faculty of Taſte as an ultimate fact or principle of human nature, in explaining thoſe gratifications which are thus ſhewn to have their ſource in other acknowledged emotions of the mind. If the concluſions to which our inveſtigations of the reaſoning powers of man have led be well founded, there is likewiſe no cauſe for conſidering Judgment and Reaſoning as ſeparate and independent faculties of the human mind, but only as varied modes of exerting the ſingle faculty of Reaſon.

In the ſcience of Metaphyſics, therefore, as in Phyſics, let us be circumſpect in our obſervations, and in the admiſſion of facts; as well as cautious how we claſs together phenomena, which may have ſome things in common, and yet are not eſſentially of the ſame order.

All philoſophy, as we have had occaſion to obſerve at the outſet of this work, may be arranged under two general heads, or diviſions; Phyſics, which treats of the laws of matter; and Metaphyſics, which treats of the laws of mind. Under each of theſe general claſſes is comprehended a variety of more ſubordinate branches of ſcience, admitting of a conſiderable diverſity in the mode of their cultivation, and the certainty to which they can be expected to attain. Thus, we cannot at preſent look for the ſame certainty in the ſpeculations of the phyſiologiſt, or even of the chemiſt, as has been attained in Mechanical philoſophy, although all theſe are equally branches of Phyſical ſcience. Again, in the caſe of Metaphyſical ſcience, the departments of Politics and Juriſprudence are doubtleſs leſs certain in their concluſions than thoſe of Ethics, or even Pneumatology. To enter into a detail of the degree of evidence to which each department of philoſophical ſcience is calculated to attain, or of the peculiarities which neceſſarily occur in their modes of inveſtigation, is a taſk to which the abilities of the author of this work are by no means adequate. It is preſumed, however, that the general remarks which have been made upon the two great diviſions of philoſophical ſcience, are, in a great meaſure, applicacable to all its ſubordinate departments; and may, with advantage, be kept in view by thoſe who are deſirous of advancing any of theſe branches of knowledge.

Beſides the ſciences of Mathematics, and Philoſophy properly ſo called, there are ſome other branches of knowledge which have occaſionally been conſidered as ſcientific, and in which the reaſoning faculty is to a certain extent concerned. Such are hiſtory, natural, civil, and eccleſiaſtical; voyages, antiquities, &c. The chief object in theſe branches of knowledge, is the aſcertaining of facts; and in ſo far as this is the caſe, the obſervations which have already been made on the evidence of teſtimony, or on that of the fundamental facts of Phyſics and Metaphyſics, are applicable here. Theſe branches of knowledge, too, occaſionally indulge in ſpeculations of a philoſophical nature reſpecting the dependence of events on each other, and the tracing the effects of remote cauſes. When this is the caſe, the reaſonings muſt be conducted on ſimilar principles as in works profeſſedly philoſophical, and muſt conſiſt in an application of the previouſly aſcertained general doctrines to ſpecific inſtances.

Thus, if the preceding obſervations be well founded, the great inſtrument which we employ, in the cultivation of ſcience, is that ſelf-evident truth, or principle of reaſon, which teaches us, that whatever is true of the genus, is true of all the ſpecies of that genus. The conviction of this truth, induces us to claſſify and arrange all the phenomena of the material and intellectual world, in order that we may apply previouſly eſtabliſhed truths, to new and peculiar caſes. By the aid of the ſame inſtrument we apply the maxims and rules of judging, which experience has led us to form for the detection of error, or miſrepreſentation, in what are offered to us as facts or phenomena whereon to ground our concluſions. And, with this truth as his chief guide, the mathematician proceeds,

ceeds, from a few ſimple principles, ſtep by ſtep, to demonſtrate the relations which exiſt in the moſt complicated examples of quantity and figure.

The boaſted inſtrument of the ancient Logic, the *ſyllogiſm*, conſiſts in nothing other than a formal expreſſion of this great truth; the major propoſition being an enunciation of ſome general law; the minor, of ſome ſpecific caſe of that law; and the concluſion, the obvious inference, that the aſſertion contained in the major, may be applied to the particular caſe expreſſed by the minor propoſition. The acute genius of Ariſtotle, no doubt, ſaw the very general application of this truth in the inveſtigations of ſcience; and, in particular, that the deductions of Mathematics are eaſily reducible under this principle of reaſon. Yet that ſagacious philoſopher was evidently guilty of the moſt perverted application of his ingenuity, when he exhauſted it in aſcertaining all the various forms in which the ſyllogiſm could be expreſſed; and in pointing out what were the legitimate forms, or, according to the logical language, *modes* and *figures* of the ſyllogiſm, and what forms were not legitimate. For, in fact, a common underſtanding ſees at once whether a ſyllogiſm be expreſſed in a legitimate form or not; that is, whether it truly exemplifies the fundamental axiom, that the properties of the genus belong to all the individuals of that genus.

In doing this, Ariſtotle exhauſted his talents in perfecting the inſtrument of ſcientific inveſtigation, which, in fact, was ſufficiently perfect in itſelf, inſtead of ſucceſsfully employing it in the proceſs of diſcovery. His boaſted Logic exhibits, likewiſe, another fundamental miſapprehenſion of the nature of ſcientific reſearch, as it repreſents the proceſs of diſcovery to be ſynthetical, in material and intellectual ſcience, as well as in Mathematics; and, accordingly,

cordingly, attempts to lay down a ſet of general firſt principles, arranged under *categories* and *predicables*, from which all the inveſtigations in theſe ſciences are to flow: whereas, it is now well underſtood, as has been repeatedly obſerved in the preſent work, that the proceſs of diſcovery, in the ſciences of exiſting things, is analytical; riſing from the examination of particular facts and phenomena, to the aſcertaining of general laws and firſt principles.

A rational ſyſtem of Logic, calculated to ſerve as a guide for the diſcovery of truth, and detection of error, in ſcientific inveſtigation, ought, it ſhould ſeem, to proceed in a very different manner. Such a ſyſtem ought to be founded upon an analyſis of thoſe faculties of the human mind, by which the various kinds of truth are made known to us, with a view, particularly, to aſcertain the degree of evidence accompanying the teſtimony of each, and the ſources of error to which they may be more peculiarly liable. In ſuch a ſyſtem, the faculty of Reaſon naturally demands a full inveſtigation; and the examination of thoſe firſt truths, which are either immediately made known by that faculty, or are the province of other intellectual powers, is evidently an object of primary importance. Along with this, our ſyſtem of Logic would require an examination of the proceſs of diſcovery, adapted to each particular ſcience, and a detection of the ordinary ſources of error, and falſe reaſoning, to which each may be expoſed. In doing this, it would be very deſirable to meaſure, as accurately as may be, the degree of credit which is due to every attempt at new diſcovery in ſcientific inveſtigation, whether of particular facts or general laws; to diſtinguiſh what is certain, from what is only probable; and to proportion our aſſent to the degree of evidence which actually accompanies the propoſed diſcovery.

The author of the preſent Sketch, is far from believing himſelf adequate to the execution of a work of ſuch importance, or capable of ſatisfactorily filling up the outline which he has here drawn. Indeed, if ſuch a ſyſtem of Logic were completely executed, it is not too much to ſay, that it would go far in putting a ſtop to the progreſs of falſe philoſophy, and illegitimate reaſoning, in the various departments of Science, and, conſequently, would prove a moſt important benefit to mankind.

FINIS.

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